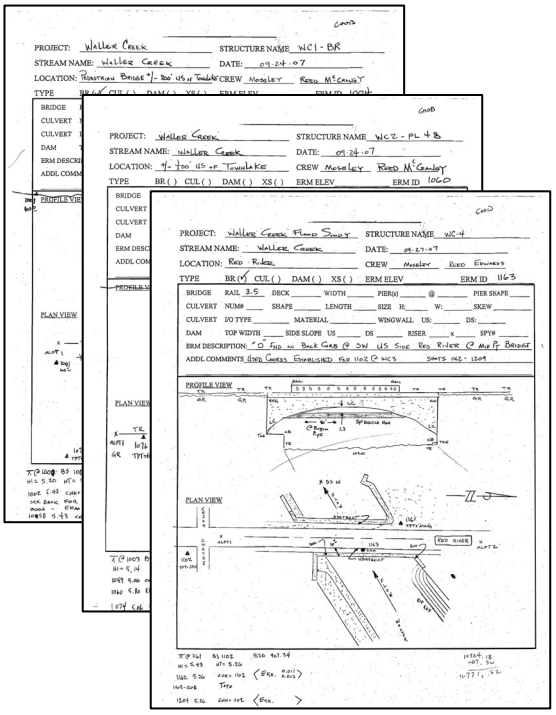
Technical Support Data Notebook

Waller Creek Tunnel Project

Watershed Restudy
Survey Data



City of Austin

Prepared in association with:
McGray & McGray Land Surveyors, Inc.

November 14, 2008

Reference No. 06030.02.111

KELLOGG BROWN & ROOT SERVICES, INC.
ESPEY CONSULTANTS, INC.
Brown & Root / Espey Padden Joint Venture

WALLER CREEK TUNNEL PROJECT
Technical Support Data Notebook
Watershed Restudy – Survey Data

Prepared for:

City of Austin
One Texas Center
505 Barton Springs Rd. 12th Floor
Austin, TX 78704

Prepared in association with:
McGray & McGray Land Surveyors, Inc.

By:

Kellogg Brown & Root Services, Inc.
Espey Consultants, Inc.
(Brown & Root/Espey Padden Joint Venture)
3809 South 2nd St., Suite B-300
Austin, Texas 78704

T (512) 326-5659
F (512) 326-5723

November 14, 2008

Reference No. 06030.02.111

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1.0 TASK SUMMARY

1.1 INTRODUCTION

The Waller Creek Restudy is a comprehensive hydrologic and hydraulic analysis of the Waller Creek watershed located with Austin, Travis County, Texas. The restudy is a project task item associated with the overall Waller Creek Tunnel Project conducted on behalf of the City of Austin by the Brown & Root / Espey Padden Joint Venture (currently known as Kellogg Brown & Root Services, Inc. and Espey Consultants, Inc.). The scope of services for this restudy is described in Attachment 7 within the *Waller Creek Tunnel Project, Proposal for Professional Engineering Services, Design & Bid Phase (Phase B1)* dated September 2007. The specific surveying scope of services for the Waller Creek Tunnel Project is described in Attachment B within the proposal dated September 2007. Note that this restudy does not serve as the Waller Creek Tunnel design model. The deliverables for this Survey Technical Support Data Notebook (TSDN) include digital copies of all survey data, tables containing control points, and certification of quality assurance. The included CD/DVD contains the digital support data as well as a PDF version of the complete report.

1.2 PERFORMANCE WORK STATEMENT

1.2.1 Scope

For the 7.6 miles of stream scoped for detail study, the survey analysis is comprised of field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary bench marks, and obtaining the physical dimensions of hydraulic and flood control structures as needed to complete the hydraulic analysis. The survey analysis includes the following action items:

- A detailed cross section surveyed on the upstream side of each structure along the survey limits;
- A spot elevation of the creek centerline at the downstream side of each structure along the survey limits;
- A cross section along the centerline (top of road) of each bridge or structure along the survey limits; and
- High-definition scanning (aka terrestrial LIDAR, aka cloud burst survey) between 3rd Street and 8th Street and between Red River and15th Street.

1.2.2 Standards

All work conducted under this task conforms to the standards specified in Attachment 7 or Attachment B within the *Waller Creek Tunnel Project, Proposal for Professional Engineering Services, Design & Bid Phase (Phase B1)* dated September 2007. Final horizontal coordinates are provided on the Texas Central (Zone 4203) State Plane Coordinate System on the North American Datum of 1983 (NAD83). Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88). The high-definition scanning has a horizontal and vertical accuracy of 1/8 inch and 1/8 inch, respectively. The on-the-ground survey data accuracy ranges depending on terrain. For hardscape terrain such as concrete, on-the-ground data has a horizontal and vertical accuracy of approximately 1/8 inch. For variable terrain such as densely vegetated areas or loose soil areas, on-the-ground data has a horizontal and vertical accuracy of approximately 0.3 feet.

1.2.3 Deliverables

Upon completion of the field surveys and reconnaissance, the results are submitted to the City of Austin for Quality Assurance and Quality Control (QAQC) review in accordance with the delivery dates specified in task orders. The following products are available in this document:

- Maps and drawings that provide the detailed survey results;
- Survey notebook containing cross sections and structural data;
- Appropriate Contractor Certification for Quality Assurance for survey data; and
- All backup or supplemental information used in the analysis is provided.

1.3 STUDY AREA AND STREAMS

All streams studied as part of the Waller Creek Restudy are detailed study streams. The table shown below lists the streams included as part of this restudy. The number of structures surveyed for each study stream is also included in the table.

Table 1. Studied Streams Table

Stream	Limits of Study	Length (ft)	No. Structures
Waller Creek	From confl. with Colorado River to D/S face of Lamar Blvd.	35,000	80
Hemphill Branch	From confl. with Waller Creek to D/S face of W. 33rd St.	5,000	14
	Total	*40,000*	*94*
	Total Reach Length (miles)	*7.6*	

1.4 WATERSHED MAPS

All streams studied as part of the Waller Creek Restudy are detailed study streams. A sketch showing the Waller Creek watershed and its location within Travis County is shown below. The streams included as part of the detailed study are indicated in the sketch.

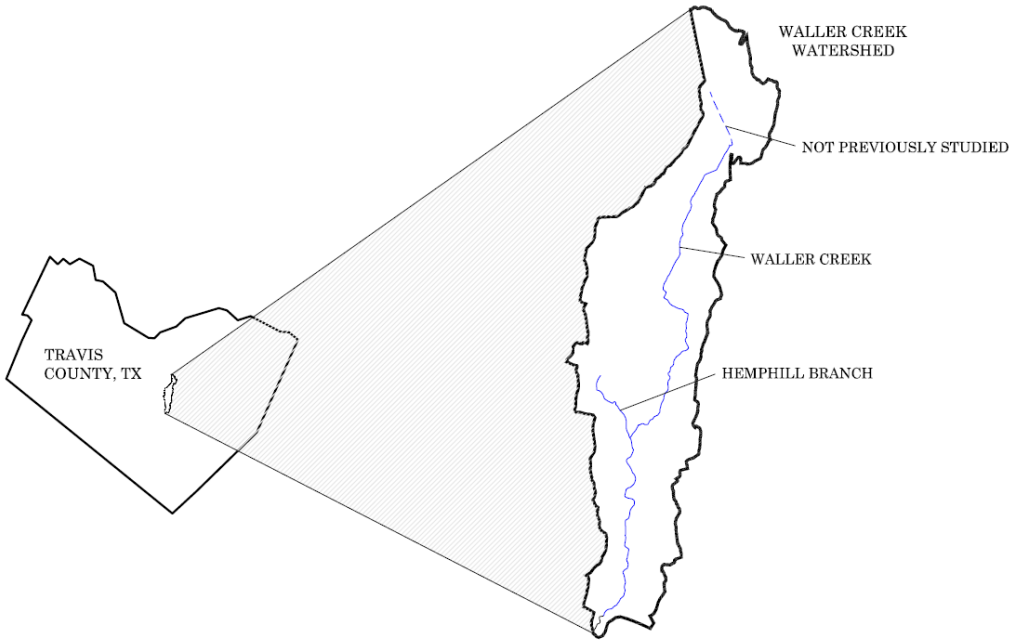


Figure 1. Detail Study Basin Relative to Travis County

2.0 METHODOLOGY

2.1 PRIMARY CONTROL POINTS

Global Positioning System (GPS) Static surveying procedures are used to calculate the primary control points for this floodplain study. Ten (10) primary control points are set for this study. The coordinates of these points are processed in house using Trimble Geomatic Office software. As part of the network adjustment, existing City of Austin Benchmark as well as five local Continuously Operating Reference Stations (CORS) are used to determine our horizontal and vertical positions for the primary control. A table listing the primary control points is included in Section 6 of the Survey TSDN. A figure illustrating the location of the primary control points is included in Section 7 of the Survey TSDN.

2.2 SECONDARY CONTROL POINTS

Real-Time Kinematic (RTK) GPS surveying methods are utilized to set secondary control points from the primary control points. The secondary control points are located near the structures and cross section surveyed for this floodplain study. The positional data collected using the secondary control points are then used as control for the specific features needed for a hydraulic survey. Approximately 122 secondary control points are used in this study. A table listing the secondary control points is included in Section 6 of the Survey TSDN. A figure illustrating the location of the secondary control points is included in Section 7 of the Survey TSDN.

2.3 ELEVATION REFERENCE MARKS

Approximately 99 Elevation Reference Marks (ERMs) are set for the Waller Creek floodplain study. Most of the ERMs are set close to a structure that was included in the study. A table listing the elevation reference marks is included in Section 6 of the Survey TSDN.

2.4 HYDRAULIC STRUCTURES

Approximately 94 structures and 1 field cross section are surveyed for this restudy and are listed in a table included as Section 6 of the Survey TSDN. The survey data is collected following surveying standards set by FEMA under the April 2003 *Guidelines and Specifications for Flood Hazard Mapping Partners,* Appendix A, and the *Preliminary Data Capture Guidelines*, Appendix N, dated April 2004.

3.0 EXCEPTIONS

There are no known deviations from the approved original scope of work for this survey analysis.

4.0 RESULTS / CONCLUSIONS

Use of Global Positioning (GPS) Surveying for primary control and Real-Time Kinematic (RTK) GPS Surveying for the secondary control points was effective and efficient. Desired accuracies were obtained through redundancy within the shortest time frame possible.

Use of Convectional Surveying using a total station for the cross sections and structures was the appropriate procedural method. Significantly dense vegetation and trees prohibited the use of RTK GPS. Desired accuracies were obtained for this positional data using this method.

The Positional data for the Elevation Reference Marks (ERM) was obtained using a combination of GPS Surveying methods and Conventional Surveying methods. This combination of surveying methods was the desired approach due to the dense vegetation and trees and the short schedule.

5.0 REFERENCES

Autodesk, AutoCAD Map / AutoCAD LDD3

Watershed Concepts, WISE (Watershed Information System), Greensboro, North Carolina

Trimble Geomatics Office 1.6.1.25
Trimble Data Transfer v.1.14.0.56
Trimble GPSLOAD
Trimble Survey Controller v.10
Trimble Exchange 2.2.0.138
Trimble Planning v.2.7.0.0
CORPSCON6 v.7.0.3.10180

6.0 LIST OF STANDALONE TABLES

6.1) Studied Streams Table

6.2) Primary Control Points

6.3) Secondary Control Points

6.4) List of Elevation Reference Marks

6.5) Surveyed Structures

6.1) Studied Streams Table

WALLER CREEK TUNNEL PROJECT
Waller Creek Restudy

TABLE 6.1 - STUDIED STREAMS TABLE

Stream	Limits of Study	Length (ft)	No. Structures
Waller Creek	From confl. with Colorado River to D/S face of Lamar Blvd.	35,000	80
Hemphill Branch	From confl. with Waller Creek to D/S face of W. 33rd St.	5,000	14
	Total	*40,000*	*94*
	Total Reach Length (miles)	*7.6*	

6.2) Primary Control Points

TABLE 6.2 - PRIMARY CONTROL POINTS

POINTS	NORTHING	EASTING	ELEVATION (FT. NAVD88)	DESCRIPTION
1	10068060.984	3114901.622	455.558	DISK MONUMENT SET
2	10070424.812	3116530.550	470.335	DISK MONUMENT SET
3	10073239.599	3116492.694	487.736	DISK MONUMENT SET
4	10075013.485	3116626.459	502.013	DISK MONUMENT SET
5	10078579.262	3117173.580	531.673	IRON ROD SET WITH CAP
6	10081687.872	3118853.031	575.938	IRON ROD SET WITH CAP
7	10085530.272	3118605.807	610.341	IRON ROD SET WITH CAP
8	10090972.799	3120158.211	652.842	IRON ROD SET WITH CAP
9	10093557.609	3122387.867	688.853	IRON ROD SET WITH CAP
10	10096043.188	3121502.777	714.450	IRON ROD SET WITH CAP
11	10073616.479	3116749.723	495.768	DISK MONUMENT FOUND

6.3) Secondary Control Points

TABLE 6.3 - SECONDARY CONTROL POINTS

POINTS	NORTHING	EASTING	ELEVATION (FT. NAVD88)	DESCRIPTION
1000	10067775.642	3114848.812	439.340	60D NAIL SET
1076	10067845.362	3115075.979	453.360	60D NAIL SET
1001	10067664.307	3115001.015	444.090	60D NAIL SET
1003	10067999.318	3114899.332	450.290	60D NAIL SET
2587	10076368.495	3116552.335	536.459	60D NAIL SET
3303	10079563.995	3118392.306	547.949	80D NAIL SET
3293	10079564.052	3118392.264	547.993	80D NAIL SET
1609	10071570.323	3116696.330	475.695	"X" SET IN CONCRETE
4243	10086410.925	3118739.568	616.135	"X" SET IN CONCRETE
4244	10086758.083	3118941.359	615.076	"X" SET IN CONCRETE
3358	10081543.900	3118947.915	566.760	"X" SET IN CONCRETE
1210	10069134.275	3116134.958	456.718	IRON RON SET WITH CAP
1414	10070498.194	3116557.275	470.663	IRON RON SET WITH CAP
1515	10071025.164	3116757.418	465.281	IRON RON SET WITH CAP
1818	10072632.233	3116664.742	480.686	IRON RON SET WITH CAP
1819	10072901.273	3116636.864	480.621	IRON RON SET WITH CAP
1920	10073225.422	3116628.575	491.707	IRON RON SET WITH CAP
2016	10071862.256	3116741.305	482.502	IRON RON SET WITH CAP
2017	10072024.382	3116585.967	479.274	IRON RON SET WITH CAP
4697	10093670.230	3122306.530	688.218	IRON RON SET WITH CAP
2691	10077016.600	3116677.208	523.332	IRON RON SET WITH CAP
2692	10076875.897	3116776.210	518.078	IRON RON SET WITH CAP
102953	10078288.666	3116879.175	528.369	IRON RON SET WITH CAP
3754	10082992.641	3119810.883	582.560	IRON RON SET WITH CAP
3756	10083612.700	3119702.542	588.610	IRON RON SET WITH CAP
2117	10073626.437	3116530.521	491.165	IRON RON SET WITH CAP
2881	10077774.751	3116837.375	523.608	IRON RON SET WITH CAP
3195	10078907.038	3117759.661	539.218	IRON RON SET WITH CAP
3196	10079088.831	3117907.320	541.318	IRON RON SET WITH CAP
3308	10080069.352	3118678.795	554.058	IRON RON SET WITH CAP
3359	10081833.231	3119145.675	570.048	IRON RON SET WITH CAP
3360	10081980.907	3119110.703	567.426	IRON RON SET WITH CAP
3361	10082487.407	3119583.146	577.735	IRON RON SET WITH CAP
3362	10082559.474	3119447.105	572.773	IRON RON SET WITH CAP
4245	10087208.850	3119072.772	622.211	IRON RON SET WITH CAP
4246	10087315.570	3118864.764	626.665	IRON RON SET WITH CAP
4417	10088412.377	3119554.451	634.197	IRON RON SET WITH CAP
4467	10090886.838	3120122.747	652.478	IRON RON SET WITH CAP
2880	10077763.382	3117014.924	524.895	IRON RON SET WITH CAP
3064	10078288.666	3116879.175	528.369	IRON RON SET WITH CAP
3879	10084083.568	3119886.849	591.427	IRON RON SET WITH CAP
3881	10084982.953	3119749.654	601.570	IRON RON SET WITH CAP
3882	10085074.946	3119251.331	602.470	IRON RON SET WITH CAP
3885	10085171.876	3118821.779	607.600	IRON RON SET WITH CAP
4694	10092151.606	3121075.977	663.437	IRON RON SET WITH CAP

TABLE 6.3 - SECONDARY CONTROL POINTS

POINTS	NORTHING	EASTING	ELEVATION (FT. NAVD88)	DESCRIPTION
4695	10092264.537	3121466.671	671.136	IRON ROD SET WITH CAP
1161	10068836.116	3115662.419	457.418	MAG NAIL SET
1211	10069382.395	3116357.484	463.386	MAG NAIL SET
1312	10070115.981	3116558.566	469.425	MAG NAIL SET
1415	10070692.679	3116491.371	456.822	MAG NAIL SET
1514	10070887.523	3116448.155	475.805	MAG NAIL SET
1566	10071162.337	3116730.178	468.008	MAG NAIL SET
1610	10071702.940	3116744.730	467.295	MAG NAIL SET
2018	10071989.316	3116715.758	468.308	MAG NAIL SET
2095	10071703.050	3116744.722	467.336	MAG NAIL SET
2327	10074837.030	3116748.957	500.290	MAG NAIL SET
2328	10074899.728	3116619.955	501.400	MAG NAIL SET
3755	10083505.374	3119838.637	586.277	MAG NAIL SET
3760	10084036.165	3119606.264	595.710	MAG NAIL SET
939	10069588.328	3116591.720	464.612	MAG NAIL SET
940	10069473.821	3116568.977	464.628	MAG NAIL SET
2118	10073934.384	3116754.395	491.500	MAG NAIL SET
2212	10074285.173	3116830.319	499.993	MAG NAIL SET
2213	10074578.957	3116960.740	499.660	MAG NAIL SET
3759	10083944.733	3119763.262	590.385	MAG NAIL SET
3239	10079309.346	3118143.272	548.576	MAG NAIL SET
3240	10079356.240	3118070.225	552.721	MAG NAIL SET
3309	10080425.520	3118739.509	555.490	MAG NAIL SET
3310	10080333.927	3118910.323	559.220	MAG NAIL SET
3365	10082730.698	3119912.981	578.315	MAG NAIL SET
4198	10085868.375	3118635.818	613.224	MAG NAIL SET
4462	10089323.848	3119613.890	639.320	MAG NAIL SET
4463	10089655.793	3119814.157	640.990	MAG NAIL SET
4464	10089982.408	3119991.692	643.480	MAG NAIL SET
4465	10090262.305	3120130.415	646.090	MAG NAIL SET
4466	10090643.520	3120107.508	648.780	MAG NAIL SET
2586	10076346.839	3116802.096	514.819	MAG NAIL SET
2789	10077183.679	3117020.073	527.201	MAG NAIL SET
102954	10077183.679	3117020.073	527.202	MAG NAIL SET
2588	10077268.363	3117033.207	528.676	MAG NAIL SET
2787	10077268.363	3117033.207	528.675	MAG NAIL SET
3307	10080177.759	3118435.837	557.379	MAG NAIL SET
3878	10084153.816	3119825.826	592.395	MAG NAIL SET
3880	10084860.085	3119611.311	600.437	MAG NAIL SET
3883	10085077.295	3119353.106	602.770	MAG NAIL SET
3884	10085132.622	3119007.765	605.833	MAG NAIL SET
3886	10085366.304	3118781.833	608.468	MAG NAIL SET
4692	10091917.946	3120837.663	661.455	MAG NAIL SET
4693	10091815.056	3120983.761	663.106	MAG NAIL SET
4696	10092588.440	3121621.051	672.411	MAG NAIL SET
4699	10079371.734	3116454.132	539.930	MAG NAIL SET

TABLE 6.3 - SECONDARY CONTROL POINTS

POINTS	NORTHING	EASTING	ELEVATION (FT. NAVD88)	DESCRIPTION
2949	10078597.969	3116753.128	531.834	MAG NAIL SET
2950	10078806.371	3116720.331	533.184	MAG NAIL SET
2951	10078958.196	3116662.251	536.829	MAG NAIL SET
1150	10068061.009	3114901.531	455.541	MONUMENT FOUND
1417	10070424.806	3116530.449	470.269	MONUMENT FOUND
1102	10068429.024	3115650.261	466.077	COTTON SPINDLE SET
1714	10072204.804	3116610.812	476.778	COTTON SPINDLE SET
1715	10072439.831	3116578.575	479.718	COTTON SPINDLE SET
3295	10079420.246	3118646.694	550.219	COTTON SPINDLE SET
3304	10079420.246	3118646.694	550.219	COTTON SPINDLE SET
3363	10082768.360	3119859.861	578.514	COTTON SPINDLE SET
3364	10082655.268	3120060.134	585.284	COTTON SPINDLE SET
4197	10085650.243	3118544.815	611.007	COTTON SPINDLE SET
4416	10088399.095	3119405.036	633.550	COTTON SPINDLE SET
1101	10068624.923	3115343.242	455.933	COTTON SPINDLE SET
15735	10072367.813	3116535.609	480.110	"X" SET IN CONCRETE
4242	10086072.349	3118603.360	613.499	"X" SET IN CONCRETE
4698	10093957.333	3122381.466	685.620	IRON ROD SET WITH CAP
14698	10093957.331	3122381.697	685.643	IRON ROD SET WITH CAP
1921	10073119.574	3116536.003	482.999	IRON ROD SET WITH CAP
5536	10079672.906	3116087.941	554.201	IRON ROD SET WITH CAP
5535	10079831.131	3116024.716	546.572	IRON ROD SET WITH CAP
5089	10080324.876	3115285.195	556.944	IRON ROD SET WITH CAP
5090	10080709.830	3115000.042	562.379	IRON ROD SET WITH CAP
5091	10081241.892	3115152.305	568.794	IRON ROD SET WITH CAP
5092	10081635.559	3115322.347	573.893	IRON ROD SET WITH CAP
1311	10069761.704	3116500.924	466.088	MAG NAIL SET
2319	10074501.881	3117179.544	512.194	MAG NAIL SET
2329	10075272.282	3116908.086	509.060	MAG NAIL SET
2638	10076463.301	3116844.256	515.285	MAG NAIL SET
5085	10079672.878	3116087.833	554.251	MAG NAIL SET

6.4) List of Elevation Reference Marks

TABLE 6.4 - LIST OF ELEVATION REFERENCE MARKS		
WALLER CREEK		
ERM WC1	440.08	"□" cut on upstream right abutment #1004
ERM WC2	447.01	"□" cut on upstream right top pipe at ground
ERM WC3	453.51	"□" cut on upstream right back curb at abutment
ERM WC4	457.46	"□" cut found on back curb at sidewalk upstream side Red River at mid pt Bridge
ERM WC5	457.56	"□" cut on downstream back curb at mid pt bridge
ERM WC6	464.24	Δ found on upsteam back curb ± 3' east of west end curb #1266
ERM WC7	466.02	"□" cut on upstream back curb ± 30' west of E Waller Creek #1314
ERM WC8	469.57	"□" cut on upstream back curb at west end bridge
ERM WC9	470.84	Δ found on upsteam back curb at E Waller Creek bridge
ERM WC10	456.80	"□" cut on upstream right top bridge at SW
ERM WC11	474.48	"□" cut on upstream back curb at E Waller Creek #1517
ERM WC12	468.55	"+" found on upsteam SW at E Waller Creek
ERM WC13	475.62	"□" cut on upstream curb at E Waller Creek #1612
ERM WC14	467.77	"□" cut on upstream rail ± 6' west of E Waller Creek
ERM WC15	480.74	"□" cut on upstream back curb 11th St #2020
ERM WC16	479.59	"□" cut on upstream back curb (west side Red River) at E Waller Creek #2048
ERM WC17		"□" cut on top curb west side Red River at end WC16
ERM WC18	469.69	"□" cut on upstream right rail
ERM WC19	479.76	"□" cut on upstream left curb ± 6' west of east end bridge
ERM WC20	474.98	"□" cut on upstream rail at E Waller Creek
ERM WC21	476.34	"□" cut on upstream rail at E Waller Creek
ERM WC22	477.20	"□" cut on upstream rail at E Waller Creek #1972
ERM WC23	490.10	"□" cut on upstream sidewalk at E Waller Creek #1923
ERM WC24	491.71	"□" cut on upstream back curb at E Waller Creek #2120
ERM WC25	492.43	"□" cut on upstream back curb at E Waller Creek #2166

ERM WC26	500.30	"Δ" cut on upstream left rail at end sidewalk beginbridge #2215
ERM WC27	503.26	"□" cut found on upstream back curb at E Waller Creek
ERM WC28	501.16	"□" cut found on upstream back curb at E Waller Creek
ERM WC29	500.67	"□" cut on upstream left abutment #2379
ERM WC30	502.38	"□" cut found on upstream left back curb at abutment at2431
ERM WC31	508.91	US Coast & Geodetic survey marker brass disc found upsteam left rail
ERM WC32	508.65	"□" cut on downstream left sidewalk at top abutment
ERM WC33	511.91	UT brass disc found at upsteam left back curb
ERM WC34	515.21	"□" cut found on upstream right top deck at brick bench seat
ERM WC35	520.64	"□" cut on upstream left top rail #2694
ERM WC36	525.40	"□" cut on upstream right top rail
ERM WC37	523.91	"□" cut on downstream left top deck at left rail
ERM WC38	526.34	"□" cut on upstream right top deck at steps
ERM WC39	524.19	UT monument #17 found at upsteam left sidewalk
ERM WC40	526.32	"□" cut on upstream left curb at beginning ped bridge #3066
ERM WC41	528.71	"□" cut on upstream left top deck at beginning of bridge
ERM WC42	531.37	"□" cut on upstream left curb at beginning of bridge
ERM WC 43	536.45	"□" cut on upstream left top deck at abutment
ERM WC44	540.54	"□" cut on upstream right top deck at abutment
ERM WC45	546.92	"□" cut on downstream right curb at end bridge
ERM WC46	552.14	"□" cut on upstream right top abutment at end bridge #3533
ERM WC47	556.09	"□" cut on upstream center back of curb #3312
ERM WC48	566.82	USGS brass disc found on upsteam right top deck at abutment
ERM WC49	559.80	"□" cut on upstream right top deck at end culvert
ERM WC50	571.59	"□" cut on top P5 #3458
ERM WC51	570.10	"□" cut on upstream right wingwall

ERM WC52	571.92	"□" cut on upstream right top rail at abutment #3415
ERM WC53	578.91	"□" cut on upstream right top deck
ERM WC54	577.61	"□" cut on upstream center top spillway/dam
ERM WC55	585.26	"□" cut on downstream left top rail
ERM WC56	586.83	"Δ" found cut on upsteam left top curb at beginning bridge #3807
ERM WC57	585.51	"□" cut on top P5
ERM WC 59	591.82	"Δ" found cut on upsteam right top sidewalk at abutment
ERM WC60	601.16	"□" cut on top rail of bridge
ERM WC61	601.73	"□" cut on upstream left top stone abutment at steps #4021
ERM WC62	606.59	"□" found cut on upsteam right top curb at abutment #4070
ERM WC63	607.14	"□" cut on downstream right top abutment
ERM WC64	608.96	COA brass disc found downstream left beginning bridge $4156
ERM WC65	609.99	"□" cut on upstream left top curb at beginning bridge #4201stone abutment
ERM WC66	613.55	"□" found cut on upsteam right top curb at end culvert
ERM WC67	613.71	"□" cut on upstream left top deck at beginning bridge
ERM WC68	616.51	"□" cut on downstream left top curb at beginning bridge
ERM WC70	624.58	"□" cut on upstream left top rail at abutment
ERM WC71	633.52	"□" cut on upstream left top curb at beginning culvert
ERM WC73	639.76	"□" cut found on upstream right top curb at end of culvert
ERM WC74	641.47	"□" cut on upstream left top curb at beginning of bridge #4509
ERM WC75	643.82	COA disc found on upsteam left top deck at beginning of bridge.
ERM WC76	646.27	"□" found cut downstream left on bottom of culvert at beginning of bridge.
ERM WC77	648.73	"□" cut downstream left on at top of deck
ERM WC78	652.07	"□" cut on upstream left top curb #4704
ERM WC79	661.63	"□" cut on upstream left top abutment #4749
ERM WC80	662.64	"□" cut on upstream left wingwall at beginning of bridge

ERM WC81	671.64	COA brass disc found at downstream left top deck ± 3' west of DIBI
ERM WC82	686.82	Mag nail set in upsteam left top abutment at track
ERM WC83	688.90	"□" at downstream left end of bridge
ERM WC84	687.79	"□" at upstream left top of headwall

HEMPHILL BRANCH			
ERM WCT1-01	533.14	UT disc UT34 upstream centerline sidewalk WCT1-01	***
ERM WCT1-02	533.63	"□" cut on back curb west side San Jacinto at ER service road	
ERM WCT1-03	537.22	"□" cut on curb upstream at MP curb ret	
ERM WCT1-04	536.28	"□" cut on upstream right top abutment	
ERM WCT1-05	539.04	"□" cut on upstream left top wingwall at midpoint	
ERM WCT1-06	540.20	"□" cut on upstream left top deck at sidewalk	
ERM WCT1-07	540.03	"□" cut on top wall at curb (upstream left)	
ERM WCT1-08	553.06	"□" set downstream beginning at top curb sidewalk	
ERM WCT1-09	548.30	"□" cut on upstream right top deck	
ERM WCT1-10	548.93	"□" cut on upstream centerline top curb	
ERM WCT1-11	551.33	"□" cut on upstream left at top abutment	
ERM WCT1-12	555.66	"□" cut on upstream left on concrete	
ERM WCT1-13	561.60	"□" cut upstream centerline back of curb	
ERM WCT1-14	568.03	"Δ" found downstream side back of curb	
ERM WCT1-15	573.14	"□" cut on upstream centerline back of curb	

6.5) Surveyed Structures

TABLE 6.5 - SURVEYED STRUCTURES

WALLER CREEK	
WC-BR1	PEDESTRIAN BRIDGE ± 200' UPSTREAM OF TOWNLAKE
WC-PL2	± 400' UPSTREAM OF TOWNLAKE
WC-BR3	CESAR CHAVEZ
WC-BR4	RED RIVER
WC-BR5	3RD STREET
WC-BR6	4TH STREET
WC-BR7	5TH STREET
WC-BR8	6TH STREET
WC-BR-9	7TH STREET
WC-BR10	PEDESTRIAN BRIDGE BETWEEN 7TH & 8TH STREETS
WC-BR11	8TH STREET
WC-BR12	9TH STREET
WC-BR13	10TH STREET
WC-BR14	PEDESTRIAN BRIDGE BETWEEN 10TH & 11TH STREETS
WC--CUL15	11TH STREET
WC-CUL16	RED RIVER
WC-CUL17	RED RIVER AND 11TH STREET
WC-BR18	PEDESTRIAN BRIDGE UPSTREAM OF RED RIVER AT SE CORNER OF WATERLOO PARK
WC-BR19	12TH STREET
WC-BR20	FIRST PEDESTRIAN BRIDGE UPSTREAM OF 12TH STREET
WC-BR21	SECOND PEDESTRIAN BRIDGE UPSTREAM OF 12TH STREET (WATERLOO PARK)
WC-BR22	THIRD PEDESTRIAN BRIDGE UPSTREAM OF 12TH STREET (WATERLOO PARK)
WC-BR23	FIRST PEDESTRIAN BRIDGE DOWNSTREAM OF 15TH STREET
WC-BR24	15TH STREET
WC-BR25	PEDESTRIAN BRIDGE UPSTREAM OF 15TH STREET
WC-BR26	SECOND PEDESTRIAN BRIDGE UPSTREAM OF 15TH STREET
WC-BR27	THIRD PEDESTRIAN BRIDGE UPSTREAM OF 15TH STREET
WC-BR28	TRINITY STREET
WC-BR29	BETWEEN TRINITY AND MLK
WC-BR30	MLK BLVD
WC-BR31	SAN JACINTO FIRST UPSTREAM OF MLK
WC-BR32	PEDESTRIAN BRIDGE AT INTERSECTION OF TRINITY AND SAN JACINTO
WC-BR33	EAST 21ST STREET AT SAN JACINTO
WC-BR34	PEDESTRIAN BRIDGE ± 30' UPSTREAM OF EAST 21ST STREET
WC-BR35	NORTH END OF ALUMNI CENTER/DOWNSTREAM OF EAST 22ND STREET
WC-BR36	EAST 23RD STREET
WC-BR37	FIRST PEDESTRIAN BRIDGE UPSTREAM OF 23RD STREET
WC-BR38	SECOND PEDESTRIAN BRIDGE UPSTREAM OF EAST 23RD STREET
WC-BR39	EAST 24TH STREET
WC-BR40	SAN JACINTO FIRST BRIDGE DOWNSTREAM OF DEAN KEETON
WC-BR41	PEDESTRIAN BRIDGE BETWEEN SAN JACINTO AND DEAN KEETON
WC-BR42	DEAN KEETON
WC-BR43	DOWNSTREAM OF LEONARD STREET, EASTWOODS PARK
WC-BR44	SPARKS
WC-BR45	EAST 32ND STREET
WC-BR46	PEDESTRIAN BRIDGE NEAR LANDON LANE
WC-BR47	HARRIS AVENUE
WC-BR48	EAST 38TH STREET
WC-CUL49	FIRST GOLF CART
WC-PL50	THIRD STRUCTURE DOWNSTREAM OF EAST 41ST STREET AND GOLF COURSE
WC-BR51	HANCOCK GOLF COURSE
WC-BR52	FIRST STRUCTURE DOWNSTREAM OF EAST 41ST STREET AND GOLF COURSE
WC-BR53	EAST 41ST STREET
WC-CUL54	± 10' UPSTREAM OF EAST 41ST STREET
WC-BR55	± 200' UPSTREAM OF EAST 41ST STREET AT GRIFFIN SCHOOL
WC-BR56	PARK BLVD
WC-PL57	EAST 43RD STREET
WC-BR58	BETWEEN EAST 43RD STREET AND DUVAL STREET
WC-BR59	DUVAL STREET ± 200' SOUTH OF 45TH STREET
WC-BR60	FIRST STRUCTURE UPSTREAM OF DUVAL/DOWNSTREAM OF AVENUE "G"
WC-BR61	SECOND STRUCTURE UPSTREAM OF DUVAL/DOWNSTREAM OF AVENUE "G"
WC-BR62	AVENUE "G"
WC-BR63	SHIPE PARK-UPSTREAM OF AVENUE "G"/DOWNSTREAM OF AVENUE "F"
WC-BR64	AVENUE "F"
WC-CUL65	45TH STREET
WC-CUL66	SPEEDWAY (200' NORTH OF 45TH STREET)
WC-BR67	PEDESTRIAN BRIDGE ± 200" OF SPEEDWAY
WC-CUL68	EAST 45TH STREET
WC-BR70	PEDESTRIAN BRIDGE DOWNSTREAM OF 51ST AT INTRAMURAL FIELDS
WC-CUL71	51ST STREET

WC-CUL73	NORTH LOOP
WC-BR74	FRANKLIN BLVD
WC-BR75	NELRAY BLVD
WC-BR76	WEST 55½ AND CHESTERFIELD
WC-BR77	WEST 55TH STREET
WC-BR78	KOENIG LANE
WC-BR79	SKYVIEW
WC-BR80	DOWNSTREAM OF DENSON; UPSTREAM OF SKYVIEW
WC-CUL81	DENSON DRIVE
WC-BR82	RAILROAD BRIDGE UPSTREAM OF DENSON DRIVE
WC-CUL83	GUADALUPE STREET
HEMPHILL BRANCH	
WCT1-BR1	DEAN KEETON
WCT1-PL2	PIPELINE CROSSING UPSTREAM OF DEAN KEETON
WCT1-BR3	SERVICE ROAD TO MECHANICAL ENG. BUILDING AND CHILLER #5
WCT1-PL4	JUST WEST OF INTERSECTION AT SAN JACINTO AND DUVAL/3RD STRUCTURE DOWNSTREAM OF SPEEDWAY
WCT1-BR5	SECOND STRUCTURE DOWNSTREAM OF SPEEDWAY
WCT1-BR6	FIRST STRUCTURE DOWNSTREAM OF SPEEDWAY
WCT1-PL07	FIRST STRUCTURE ± 75' OF SPEEDWAY
WCT1-BR8	SPEEDWAY
WCT1-BR9	PATIO DECK UPSTREAM OF SPEEDWAY AND SEMINARY
WCT1-BR10	SECOND PEDESTRIAN BRIDGE UPSTREAM OF SPEEDWAY
WCT1-BR11	SECOND PEDESTRIAN BRIDGE DOWNSTREAM OF 3OTH STREET
WCT1-BR12	FIRST PEDESTRIAN BRIDGE DOWNSTREAM OF HEMPHILL AND 30TH STREET
WCT1-BR13	HEMPHILL AND 30TH STREET
WCT1-BR14	WHEELER
WCT1-BR15	32ND STREET

7.0 LIST OF STANDALONE FIGURES

7.1) Study Area and Streams Figure

7.2) Control Points Figure

7.3) Structures and Cross Sections Figure

48453C0465G 48453C0455G

LADY BIRD LAKE

HEMPHILL BRANCH

WALLER CREEK

WALLER CREEK

Lamar Blvd

FM 2222

MLK Blvd

35

183

WALLER CREEK WATERSHED BOUNDARY

0 1,250 2,500 Feet

1 inch = 2,500 feet

Horizontal Projection: Texas State Plane Central Zone US Feet (4203)
Geodetic Vertical Datum: NAVD 88

Kellogg Brown & Root Services, Inc.
Espey Consultants, Inc.
In Cooperation With
City of Austin
Watershed Protection Department

WALLER CREEK TUNNEL PROJECT

DFIRM PANEL MAP INDEX

FIGURE 7.1

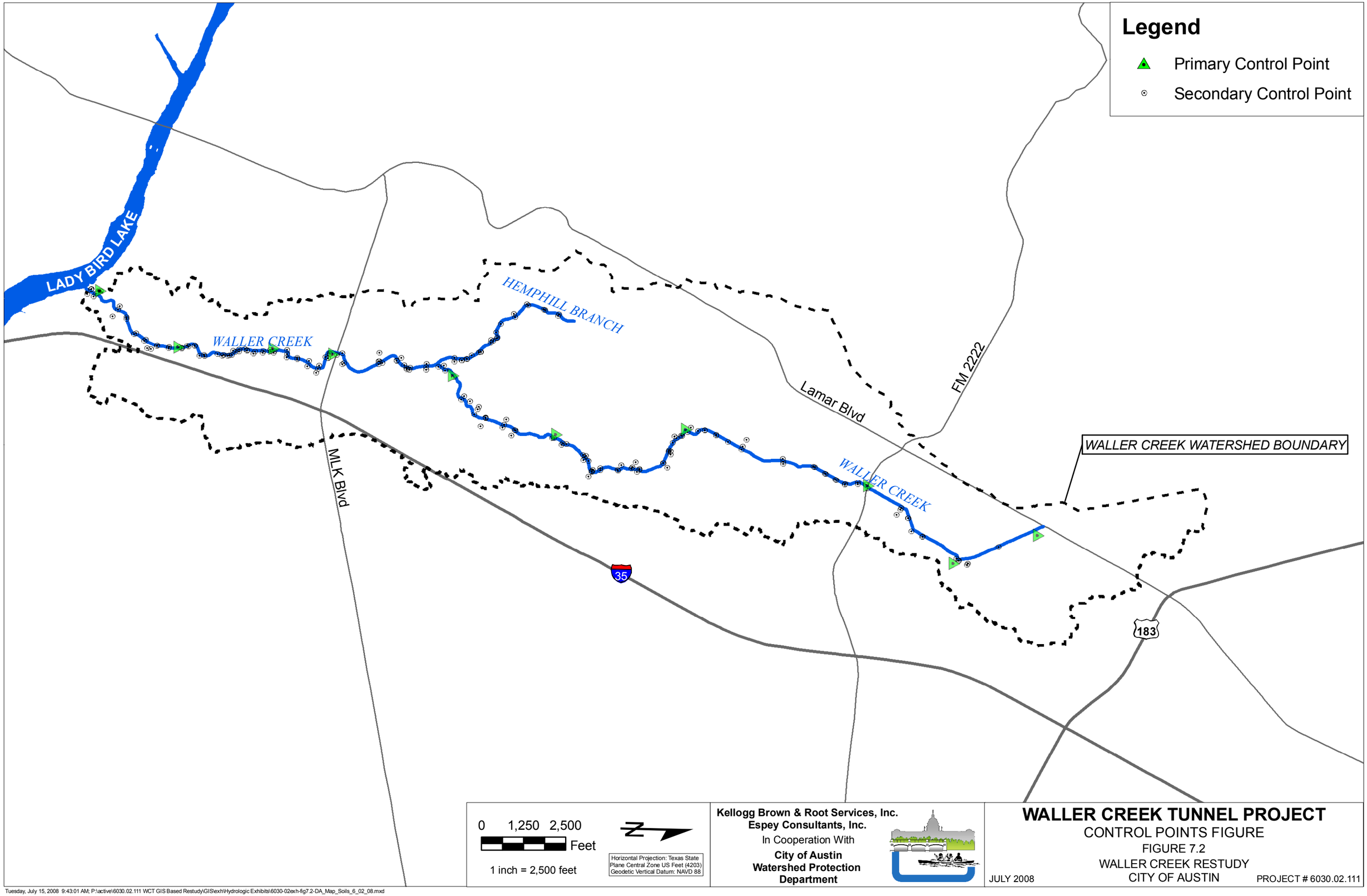
WALLER CREEK RESTUDY

CITY OF AUSTIN

JULY 2008

PROJECT # 6030.02.111

Wednesday, September 17, 2008 4:17:59 PM; P:\active\6030.02.111 WCT GIS Based Restudy\GIS\exh\TSDN Exhibits\6030-02exh-7-1-Firm_Panels.mxd



0 1,250 2,500 Feet

1 inch = 2,500 feet

Horizontal Projection: Texas State Plane Central Zone US Feet (4203)
Geodetic Vertical Datum: NAVD 88

Kellogg Brown & Root Services, Inc.
Espey Consultants, Inc.
In Cooperation With
City of Austin
Watershed Protection Department

WALLER CREEK TUNNEL PROJECT

CONTROL POINTS FIGURE

FIGURE 7.2

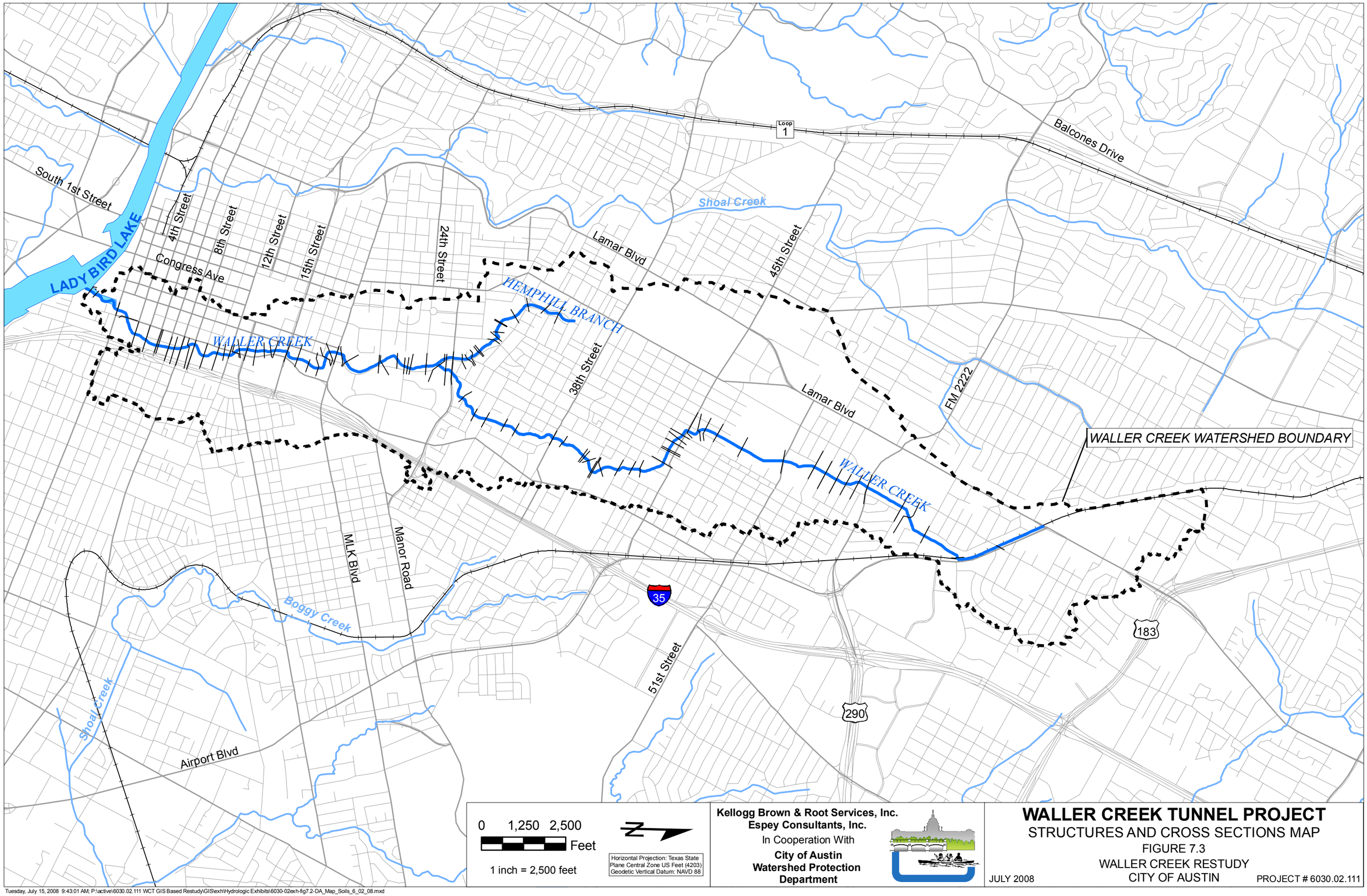
WALLER CREEK RESTUDY

CITY OF AUSTIN

JULY 2008

PROJECT # 6030.02.111

Tuesday, July 15, 2008 9:43:01 AM; P:\active\6030.02.111 WCT GIS Based Restudy\GIS\exh\Hydrologic Exhibits\6030-02exh-fig7.2-DA_Map_Soils_6_02_08.mxd



0 1,250 2,500 Feet

1 inch = 2,500 feet

Horizontal Projection: Texas State Plane Central Zone US Feet (4203)
Geodetic Vertical Datum: NAVD 88

Kellogg Brown & Root Services, Inc.
Espey Consultants, Inc.
In Cooperation With
City of Austin
Watershed Protection Department

WALLER CREEK TUNNEL PROJECT

STRUCTURES AND CROSS SECTIONS MAP

FIGURE 7.3

WALLER CREEK RESTUDY

CITY OF AUSTIN

JULY 2008

PROJECT # 6030.02.111

Tuesday, July 15, 2008 9:43:01 AM; P:\active\6030.02.111 WCT GIS Based Restudy\GIS\exh\Hydrologic Exhibits\6030-02exh-fig7.2-DA_Map_Soils_6_02_08.mxd

APPENDIX A

TSDN DOCUMENTS (Checklists/Forms)

A.1) Deliverables Checklist
A.2) Certificate of Compliance
A.3) Digital Data Submission Checklist
A.4) Mapping Information Index

A.1) Deliverables Checklist

WALLER CREEK TUNNEL PROJECT
Waller Creek Restudy

APPENDIX A.1) DELIVERABLES CHECKLIST

TSDN Category	Data Type	Data Submitted
Mapping Information	Mapping Information Index	Y
	Topographic Mapping (Hardcopy Version)	N
	Topographic Mapping (Digital Version)	N
	Summary Report of Independent QA/QC	N
	Work Maps (Hardcopy Version)	N
	Work Maps (Digital Version)	N
	Work Map Delineation Summary	N
	Preliminary DFIRM (Hardcopy Verison)	N
	CD-Rom with DFIRM Data	N
	USGS Digital Orthophoto Quadrangle(s)	N
	Soil and Vegetation Maps	N
	USGS Topographic Quadrangle Maps	N
	Flood Hazard Boundary Map	N
	Community Maps	N
	All Other maps	N
	DFIRM Database Data (Basic)	N
	DFIRM Database Data (Enhanced)	N
	Digital Data Submission Checklist	N
	Narrative	N
	Photogrammetric Survey Documentation	N
	GPS Survey Documentation	Y
Miscellaneous Reference Materials	Field Survey Notes/Notebook	Y
	SCS/NRCS Flood Hazard Analyses Reports(s)	N
	USGS Floodplain Information Reports(s)	N
	USACE Feasibility Study Reports	N
	Watershed Studies	N
	Site Visit Photographs	Y
	Community Population and Demographic	N
	Tax Base Reports	N
	Legal References	N
	(Other Relevant Materials)	N

A.2) Certificate of Compliance

WALLER CREEK TUNNEL PROJECT
Waller Creek Restudy

CERTIFICATION OF COMPLIANCE	
Project Name:	Waller Creek Restudy
Statement of Work No.:	Waller Creek Tunnel Project, Proposal for Professional Engineering Services, Design & Bid Phase (Phase B1)
Interagency Agreement No.:	N/A
CTP Agreement No.:	N/A
Statement/Agreement Date:	September 2007
Certification Date:	July 2008

	Tasks/Activities Covered by This Certification (Check all That Apply)
	Entire Project
	Topographic Data Development
	Hydrologic Analyses
	Hydraulic Analyses
	Coastal Flood Hazard Analyses
	Flood plain Mapping
X	**Other (Specify) --- Survey Data**

This is to certify that the work summarized above was completed in accordance with the statement/agreement cited above and all amendments thereto, together with all such modifications, either written or oral, as the Regional Project Officer and/or Assistance Officer or their representative have directed, as such modifications affect the statment/agreement, and that such work has been accomplished in accordance with the provisions contained in Guidelines and Specifications for Flood Hazard Mapping Partners cited in the contract document, and in accordance with sound and accepted engineering practices within the contract provisions for respective phases of the work.

Name: Chris Conrad, R.P.L.S.

Title: Project Manager

Firm/Agency Represented: McGray & McGray Land Surveyors, Inc.

Registration No.: Texas RPLS 5623

Signature:

This form mush be signed by a representative of the firm contracted to perform the work who is registered as a Professional Surveyor or by the responsible official of government agency.

A.3) Digital Data Submission Checklist

Digital Mapping Checklist

Point of Contact:

Name and/or Title	Chris Conrad, RPLS
Community/Agency	McGRAY & McGRAY LAND SURVEYORS, INC.
Department	
Address	3301 Hancock Drive Suite 6
	Austin, TX, 78731
Telephone	(512) 451-8591
Fax	(512) 451-8791
Email	chrisc@mcgray.com

Data Type:

Pertinent information includes the following:

Format:

- ❑ ESRI Coverage
- ❑ ESRI Shapefile
- ❑ MapInfo
- ❑ Intergraph
- ❑ AutoCAD
- ❑ Digital Line Graph
- ❑ Other _____

- ❑ Digital Orthophoto
  - ❑ Black & white
  - ❑ Color
  - ❑ TIF
  - ❑ JPEG
  - ❑ SID
  - ❑ PNG
  - ❑ Raw
- ❑ Scanned
  - ❑ Georeferenced? _____
  - ❑ Dots per inch _____
  - ❑ Black & white
  - ❑ Grey scale
  - ❑ Color

Source Information:

How and when were the data compiled? By whom? At what scale? Pertinent information includes the following:

- ❑ Photogrammetrically compiled
- ❑ Digitized from a hardcopy source

- ❑ Parcel maps/Plat maps
- ❑ USGS quadrangles
- ❑ Orthophotos
- ❑ Aerial photos
- ❑ Other community map _____
- ❑ Generated using coordinate geometry (COGO)
- ❑ Scanned

Date of photography or source material _____

Scale of data creation _____

Agency or firm that produced the data _____

Date of creation (if incomplete, provided estimated completion date) _____

Projection, Datums, Accuracy:

What coordinate system and projection were used? What horizontal and vertical datums were used? What is the stated accuracy of the data?

Coordinate system/projection:

- ☒ State Plane
- ❑ UTM
- ❑ Geographic (latitude and longitude)
- ❑ Other _____

Units:

- ☒ Feet
- ❑ Meters
- ❑ Decimal degrees
- ❑ Degrees, minutes, seconds
- ❑ Other _____

Horizontal datum:

- ❑ NAD27, Clarke 1866 spheroid
- ☒ NAD83, GRS80 spheroid

Vertical datum:

- ❑ NGVD29
- ☒ NAVD88
- ❑ Other _____

Accuracy _____

Data Contents:

What features are contained in the data set(s)? Are feature names included? If so, are they available as attributes and/or graphic text (annotation)? Please provide file structure details in the form of metadata, a data dictionary, or a layer list in addition to this form.

- ❑ Roads

- ❑ Centerlines
- ❑ Edge of pavement

- ❑ Road names
  Scale(s) at which they were intended to be used _____
- ❑ Railroads
  - ❑ Railroad names
- ❑ Airports
  - ❑ Airport names
- ❑ Streams, lakes, other water bodies
  - ❑ Feature names
- ❑ Range & township/section lines and numbers
- ❑ Political boundaries
  - ❑ Area names
- ❑ Flood control structures (dams, weirs, jetties, culverts, etc.)
- ❑ Floodplain boundaries and/or other FIRM features
- ❑ Contours
  Contour interval
- ❑ DEM/DTM/TIN
- ❑ Building outlines
- ❑ Parcels

Transfer Media:

What options are there for transferring the data to other users? What are the platform options?

Media:
- ☒ CD-ROM
- ❑ 8mm tape
- ❑ 4mm tape
- ❑ Zip disk
- ❑ Diskettes
- ❑ DVD
- ❑ Email
- ❑ Other _____

Platforms:
- ❑ UNIX
- ☒ PC
- ❑ NT

A.4) Mapping Information Index

WALLER CREEK TUNNEL PROJECT
Waller Creek Restudy

APPENDIX A.4) MAPPING INFORMATION INDEX

Community Name	City of Austin			State: Texas			
Community ID No.	480624						
Compiled By:	McGRAY & McGRAY LAND SURVEYORS, INC.						
Date TSDN Submitted	Jul-08						
Type/Purpose of Map	Date	Paper Copy		Electronic Media			
		No. of Sheets	Exhibit No.	File Type	File Name	Projection	Exhibit No.
Project Database Files	7/1/2008			Wise project file	Waller	State Plane NAD83 feet	

APPENDIX B

SUPPORTING DOCUMENTS

B.1) CAPCO GPS Survey Final Report

B.2) Field Survey Notes and Sketches

B.1) CAPCO GPS Survey Final Report

GPS Survey
Final Report

Capital Area
Planning Council
(CAPCO)
Mapping Project of 2003

March, 2003

Prepared By:

Sanborn
1935 Jamboree Drive, Suite 100
Colorado Springs, CO 80920
(719) 593-0093

Executive Summary

Sanborn, in support of the 2003 mapping project, established a network of 253 new control monuments for the Capital Area Planning Council (Capco), within the city of Austin, Texas and surrounding area using differential Global Positioning System (GPS) surveying techniques. These control points were designed to provide additional control for high accuracy analytical aerial triangulation solutions for new mapping and to update Capco's existing Geographic Information System (GIS) database. In addition to the new control, eleven existing National Geodetic Reference System (NGRS) monuments were occupied and included in the network. These monuments will provide a sound basis for subsequent conventional and GPS surveys within the area and will enable future surveying and mapping projects and GIS operations to be integrated on a unified system (i.e. the Texas Central State Plane coordinate system, Zone 4203).

The internal accuracy of the geodetic network achieved *first order class I* standards in all station pairings, i.e., the relative horizontal positional accuracy between stations in the network does not exceed 10 mm + 10 parts per million (ppm) of the station separation. Final horizontal coordinates are provided on the Texas Central [Zone 4203] State Plane Coordinate System on the North American Datum of 1983 (NAD83) in Appendix A. Furthermore, orthometric elevations were estimated for all points in the network using sophisticated geoidal modeling techniques and are provided on the North American Vertical Datum of 1988 (NAVD88).

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1. INTRODUCTION

This report contains the technical write-up of the differential GPS survey performed for the ground control in support of high accuracy analytical aerial triangulation (AT) solutions for the Capital Area Planning Council (Capco).

Sanborn was responsible for the fieldwork including reconnaissance of existing control points, establishment of additional control points, panel maintenance, GPS survey, all GPS data processing and reductions, and the preparation of the final report.

1.1 Purpose of the Survey

The GPS survey network was based on existing National Geodetic Reference System (NGRS) control. Additional control was set by Sanborn field personnel and consisted primarily of 12" spikes.

The densification is designed to provide ground control for high accuracy analytical aerial triangulation solutions to support the development of new and updated mapping as well as new digital ortho-photos for Capco. The network also serves to densify existing control and support subsequent surveying and mapping activities in the area enabling future surveys to be integrated on a unified system. The network consists of a total of 264 stations, of which eleven are pre-existing NGRS monuments. The horizontal and vertical datums of the GPS network are based on six horizontal NGRS published coordinates and six vertical NGS published elevations.

1.2 Duration/Time Period

The project was conducted during the month of January, 2003. The field portion of the job commenced on January 10th (Julian Day 010) and was completed on January 30th (Julian Day 030).

1.3 Contact

Questions regarding the technical aspects of this report should be addressed to:

Sanborn
1935 Jamboree Drive, Suite 100
Colorado Springs, Colorado, 80920

Telephone : 719.593.0093
FAX : 719.528.5093

1.4 Accuracy Requirements

The GPS network meets the current Federal Geodetic Control Subcommittee (FGCS) accuracy standard for *first order, class I* GPS surveys. This corresponds to a relative horizontal positional accuracy of 10 mm + 10 ppm, at the 95% level of confidence.

2. PROJECT LOCATION AND SCOPE

The project area is situated in and around the city of Austin, Texas. The total GPS network spans the following ranges of latitude and longitude:

ϕ:	N 29° 51'	$\Rightarrow$	N 30° 45'
λ:	W 97° 00'	$\Rightarrow$	W98° 22'

The GPS network diagram is presented on the following page (see figure 1).

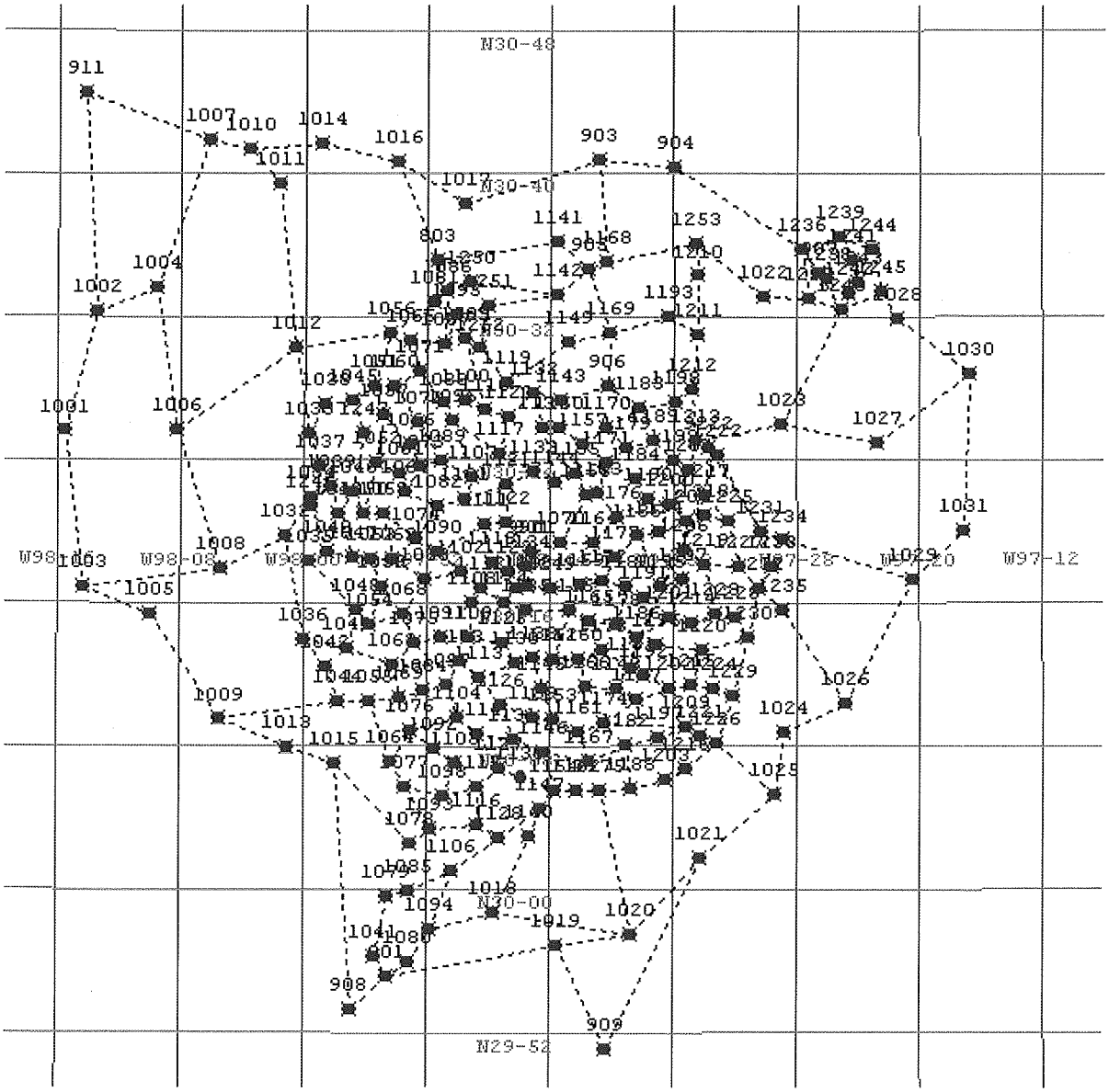


Figure 1. GPS Network

2.1 Monuments and Station Naming

The complete network contains a total of 264 stations and 365 quasi-independent baseline vectors. Numeric abbreviations were used as a substitute for the NGRS control station names for simplicity in file naming and post–processing.

GPS point numbers in the 1000 series represent newly established control points that were paneled prior to photography and required for aerial triangulation. Point

numbers in the 9000 series represent control points set as alternate control for the 1000 series points. Control point numbers in the 800 and 900 series represent NGRS vertical and horizontal control points.

Of the 264 stations included in the network, a total of 253 are new monuments, consisting of 12" spikes, set by Sanborn. Station diagrams for the 253 monuments are contained in Appendix C.

2.2 Existing Control

The GPS network was constrained horizontally to six NGS control points (901, 903, 907, 908, 909, and 911). Vertically, the network was constrained to six NGS benchmarks (801, 803, 901, 904, 905, and 906). No control stations exhibited large residuals in the final constrained adjustment indicating a good relative fit between the published coordinates.

3. CONDITIONS AFFECTING PROGRESS

A careful reconnaissance was undertaken prior to the monumentation and subsequent GPS survey. All points in the network were directly accessible by vehicle and have good satellite visibility.

The satellite window provided 24–hour coverage, and GPS observation sessions were typically scheduled between 7:00 am and 6:00 pm, local time, each day. No difficulties were experienced with solar storm activity. All baseline processing, loop misclosure analyses and preliminary least squares adjustments were performed in the field, thus allowing for quality control prior to de-mobilizing from the field.

3.1 Problems Encountered During Survey

The 9000 series points were created to replace or supplement the monumented points in situations when problems occurred in the field.

Point 9195 is a photo identifiable point used to replace point 1195 in the network. It was suspected that the aerial target was removed prior to the acquisition of the photography in that area.

Point 9222 is a photo ID point used to supplement targeted point 1222. Sometime during the course of the GPS survey and following the acquisition of the photography, the landowner removed the target and monument of point 1222. In order to effectively tie the network together, photo ID point 9222 was established.

Finally, point 9901 is a photo ID point set along with NGS control monument 901 (AUS5 A). When the field crew tried to survey to AUS5 A the access gate was locked. Point 9901 was surveyed in place of 901, and later tied to AUS5 A.

4. FIELD WORK

The GPS observations were completed between January 16th, 2003 (Julian Day 016) and January 28th, 2003 (Julian Day 028). There were no serious problems or delays in the ground GPS survey. The minor problems encountered are summarized in section 3.1.

Seven Trimble Navigation 4000SSi dual–frequency geodetic GPS receivers were used for the fieldwork, as well as one Trimble 5700 dual-frequency receiver, and one Novetel Millennium receiver. Conventional static surveying techniques were used for measuring all of the 365 baseline vectors.

Instrument heights were measured twice, once in meters and once in feet. These values were reduced and compared in the field prior to leaving a station. In the cases where a single station was occupied consecutively for more than one session, the antenna was removed and re–centered over the station mark at the start of each new session, thus fulfilling the condition for an independent setup.

5. POST PROCESSING

5.1 Baseline Processing and Preliminary Analysis

All static baseline vectors (365) were processed using Trimble Navigation's GPSurvey™ (Ver. 2.35a) software. Fixed bias solutions were adopted for all baselines. The broadcast ephemeris was used, since the accuracy and extent of the network does not warrant the use of the precise ephemeris.

The loop misclosures were checked each day. All loops comprise of quasi–independent baselines from at least two sessions and are summarized in table 2 (page 6). Every station in the network appears at least once in a loop.

The misclosures in each component (X, Y and Z) are given in millimeters and parts per million (ppm) in the WGS84 coordinate system. The spatial misclosure in ppm is also provided. All loops comprise quasi–independent baselines from at least two sessions. Every station in the network appears at least once in a loop. All loops, in fact, satisfy the guidelines for *first order* work, namely:

- in any component (X, Y, Z), the maximum misclosure does not exceed 250 mm (the worst case is 102 mm),
- in any component (X, Y, Z), the maximum misclosure in terms of the loop length does not exceed 12.5 ppm (the worst case is 4.7 ppm)
- in any component (X, Y, Z), the average misclosure in terms of the loop length does not exceed 8 ppm (the worst case is 1 ppm).

TABLE 1. LOOP MISCLOSURES

Loop	δX mm	δX ppm	δY mm	δY ppm	δZ mm	δZ ppm	Length m	δS mm
1002-911-1007-1004-1002	22	0.4	5	0.1	19	0.3	59292	0.5
1001-1002-1004-1006-1008-1003-1001	3	0.0	2	0.0	50	0.6	79870	0.6
1003-1008-1032-1036-1042-1044-1009-1005-1003	51	0.7	12	0.2	13	0.2	73015	0.7
1009-1044-1055-1064-1077-1093-1078-1015-1013-1009	14	0.2	28	0.5	38	0.7	57418	0.9
1015-1078-1093-1116-1128-1106-1085-1079-1041-801-908	10	0.1	23	0.3	45	0.6	74120	0.7
1079-1085-1106-1094-1080-801-1041-1079	12	0.4	5	0.2	22	0.8	29334	0.9
801-1080-1094-1018-1020-1019-801	15	0.3	4	0.1	37	0.7	53888	0.7
1106-1128-1147-1140-1018-1094-1106	10	0.3	33	0.9	19	0.5	36312	1.1
1140-1018-1020-1175-1162-1154-1147-1140	21	0.4	11	0.2	18	0.4	48666	0.6
1019-1020-1021-909-1019	0	0.0	2	0.0	8	0.1	52643	0.2
1175-1020-1021-1025-1226-1216-1203-1188-1175	9	0.1	37	0.6	47	0.8	57666	1.1
1226-1025-1024-1026-1235-1232-1230-1229-1226	7	0.1	12	0.2	23	0.4	53219	0.5
1235-1026-1029-1234-1231-1233-1232-1235	4	0.1	7	0.1	35	0.7	52352	0.7
1234-1029-1031-1030-1027-1023-1213-9222-1231-1234	27	0.3	14	0.2	13	0.2	83106	0.4
1027-1030-1028-1245-1240-1023-1027	10	0.2	3	0.0	13	0.2	53102	0.3
1241-1239-1244-1245-1240-1242-1243-1241	7	0.3	2	0.1	27	1.3	21114	1.3
1238-1241-1243-1242-1240-907-1238	2	0.2	1	0.1	4	0.3	14214	0.4
1236-907-1240-1237-1236	5	0.3	2	0.1	19	1.2	16288	1.2
1236-1239-1241-1238-907-1236	4	0.3	2	0.1	2	0.1	14582	0.3
1022-1237-1240-1023-1213-1212-1211-1210-1253-1022	10	0.2	28	0.5	3	0.1	60240	0.5
1236-1237-1022-1253-1168-903-904-1236	1	0.0	11	0.2	16	0.3	62385	0.3
1168-1253-1210-1211-1193-1169-905-1168	11	0.3	3	0.1	4	0.1	37805	0.3
1017-903-1168-905-1141-803-1016-1017	0	0.0	1	0.0	12	0.2	63644	0.2
803-1141-905-1142-1250-1086-1081-803	15	0.4	14	0.4	44	1.1	39032	1.3
1016-803-1081-1056-1012-1011-1010-1014-1016	19	0.3	26	0.4	9	0.1	68214	0.5
1010-1011-1012-1006-1004-1007-1010	26	0.4	4	0.1	12	0.2	71863	0.4
1012-1056-1051-1045-1038-1033-1012	8	0.2	17	0.5	5	0.2	33629	0.6
1032-1008-1006-1012-1033-1037-1039-1034-1032	8	0.1	22	0.4	3	0.1	59535	0.4
1051-1056-1081-1086-1087-1065-1071-1060-1051	4	0.1	24	0.8	37	1.2	30635	1.4
1087-1086-1250-1142-1251-1095-1087	12	0.4	3	0.1	7	0.2	31226	0.5
1251-1142-905-1169-1149-1119-1252-1251	13	0.3	6	0.2	16	0.4	39466	0.5
1119-1149-1169-906-1143-1119	3	0.1	9	0.3	3	0.1	28715	0.3
906-1169-1193-1211-1212-1198-1183-906	21	0.7	27	0.9	46	1.5	31050	1.8
1183-1198-1212-1213-1204-1199-1189-1179-1170-1183	1	0.0	2	0.1	16	0.6	28846	0.6
1222-1231-1233-1232-1227-1225-1217-1148-1222	7	0.1	8	0.1	15	0.2	75322	0.2
9222-1231-1233-1232-1227-1225-1217-9222	17	0.5	6	0.2	61	1.8	33065	1.9
1204-1213-9222-1217-1225-1218-1205-1194-1200-1204	28	1.0	10	0.4	2	0.1	27746	1.1

Loop	δX mm	δX ppm	δY mm	δY ppm	δZ mm	δZ ppm	Length m	δS mm
1199-1204-1200-1190-1176-1163-1171-1184-1199	8	0.3	20	0.8	32	1.2	26072	1.5
1170-1179-1189-1199-1184-1171-1157-1170	1	0.0	7	0.3	3	0.2	22589	0.3
1143-906-1183-1170-1157-1150-1137-1132-1143	11	0.4	0	0.0	18	0.7	27173	0.8
1137-1150-1157-1171-1155-1144-1137	4	0.2	1	0.1	29	1.5	19199	1.5
1132-1137-1144-1133-1117-1120-1132	13	0.6	26	1.1	44	1.9	23520	2.2
1095-1251-1252-1119-1143-1132-1120-1110-1099-1095	8	0.2	2	0.1	9	0.2	37756	0.3
1110-1120-1117-1096-1088-1100-1110	16	0.8	12	0.6	1	0.1	19095	1.0
1071-1065-1087-1095-1099-1110-1100-1088-1071	3	0.1	13	0.5	11	0.4	29130	0.6
1060-1071-1088-1096-1107-1089-1072-1060	41	1.4	24	0.8	21	0.8	28278	1.8
1051-1060-1072-1089-1073-1066-1057-1051	11	0.5	23	1.0	39	1.7	23346	2.0
1057-1066-1073-1067-1061-1052-1057	7	0.4	9	0.5	2	0.1	19636	0.6
1045-1051-1057-1052-1050-1046-1247-1045	8	0.3	2	0.1	19	0.7	28744	0.7
1039-1037-1033-1038-1045-1247-1046-1043-1039	5	0.2	17	0.6	29	1.0	27768	1.2
1034-1039-1043-1047-1040-1246-1034	4	0.2	8	0.4	6	0.3	18820	0.5
1047-1043-1046-1050-1058-1062-1053-1047	13	0.6	18	0.9	9	0.4	21205	1.1
1036-1032-1034-1246-1040-1035-1048-1049-1036	11	0.3	11	0.3	1	0.0	39663	0.4
1048-1035-1040-1047-1053-1059-1054-1048	17	0.7	18	0.8	22	1.0	23037	1.5
1054-1059-1053-1062-1083-1068-1054	11	0.5	6	0.3	73	3.4	21409	3.4
1083-1062-1058-1074-1090-1102-1083	12	0.5	7	0.3	6	0.3	22624	0.7
1074-1058-1050-1052-1061-1067-1082-1074	30	1.2	1	0.0	36	1.5	24367	1.9
1082-1067-1073-1089-1107-1101-1082	9	0.5	3	0.1	23	1.3	17889	1.4
1101-1107-1096-1117-1133-1121-1101	14	0.5	4	0.2	55	2.1	26144	2.2
1090-1074-1082-1101-1121-1122-1111-1090	10	0.4	8	0.3	47	1.8	25973	1.9
1102-1090-1111-1118-1123-1129-1124-1112-1102	2	0.1	6	0.2	12	0.5	24122	0.6
1134-1248-1129-1123-1118-1111-1122-9901-901-1134	7	0.4	16	0.8	88	4.6	18935	4.7
9901-1122-1121-1133-1144-1155-1158-1070-9901	2	0.1	40	1.5	33	1.2	27112	1.9
1070-1158-1155-1171-1163-1176-1164-1070	1	0.1	52	2.1	102	4.1	24938	4.6
1164-1176-1190-1200-1194-1185-1177-1164	8	0.4	20	1.0	3	0.1	20634	1.1
1205-1218-1225-1227-1219-1206-1205	10	0.5	10	0.5	0	0.0	18384	0.8
1185-1194-1205-1206-1207-9195-1185	12	0.6	9	0.5	4	0.2	19473	0.8
1177-1185-9195-1191-1180-1172-1177	12	0.6	16	0.8	36	1.9	18666	2.2
1248-1134-9901-1070-1164-1177-1172-1159-1249-1248	2	0.1	15	0.6	23	0.9	23793	1.1
1124-1129-1248-1249-1159-1156-1135-1124	9	0.5	7	0.4	70	3.8	18423	3.9
1156-1159-1172-1180-1178-1165-1156	15	0.9	5	0.3	10	0.6	16758	1.1
1178-1180-1191-9195-1207-1201-1186-1178	17	0.8	1	0.1	27	1.3	21438	1.5
1201-1207-1206-1219-1223-1214-1201	7	0.3	12	0.6	8	0.4	20087	0.8
1223-1219-1227-1232-1230-1228-1223	43	2.0	2	0.1	34	1.6	21372	2.6
1186-1201-1214-1223-1228-1230-1220-1196-1186	48	1.9	5	0.2	12	0.5	25479	2.0
1220-1230-1229-1224-1215-1220	15	0.8	7	0.4	25	1.2	19610	1.5

Loop	δX mm	δX ppm	δY mm	δY ppm	δZ mm	δZ ppm	Length m	δS mm
1196-1220-1215-1202-1192-1181-1173-1196	7	0.3	3	0.1	11	0.5	24608	0.5
1156-1165-1178-1186-1196-1173-1160-1152-1156	2	0.1	11	0.4	9	0.3	26176	0.5
1135-1156-1152-1138-1130-1125-1135	8	0.4	5	0.2	86	4.2	20753	4.2
1112-1124-1135-1125-1109-1108-1112	7	0.4	1	0.1	19	1.0	18460	1.1
1068-1083-1102-1112-1108-1109-1091-1075-1068	13	0.5	1	0.0	13	0.5	25267	0.7
1049-1048-1054-1068-1075-1063-1049	8	0.4	5	0.2	10	0.5	21068	0.6
1055-1044-1042-1036-1049-1063-1069-1055	29	1.1	15	0.5	12	0.4	27082	1.3
1069-1063-1103-1097-1084-1069	12	0.7	63	3.5	52	2.8	18106	4.5
1103-1063-1075-1091-1109-1125-1130-1113-1103	2	0.1	20	0.7	38	1.3	28581	1.5
1064-1055-1069-1084-1097-1104-1076-1064	6	0.2	76	2.7	20	0.7	27509	2.8
1077-1064-1076-1092-1105-1098-1077	1	0.0	9	0.5	97	4.7	20466	4.8
1116-1093-1077-1098-1115-1116	24	1.1	8	0.4	1	0.1	21835	1.1
1154-1147-1128-1116-1115-1127-1136-1154	22	0.9	3	0.1	23	1.0	23517	1.4
1127-1115-1098-1105-1092-1076-1104-1114-1127	13	0.4	14	0.5	6	0.2	28070	0.7
1154-1136-1127-1114-1131-1146-1154	8	0.4	15	0.7	18	0.8	21862	1.2
1131-1114-1104-1097-1103-1113-1126-1131	5	0.2	2	0.1	84	3.7	22847	3.7
1126-1113-1130-1138-1145-1153-1139-1126	4	0.2	5	0.2	27	1.2	22088	1.2
1146-1131-1126-1139-1153-1161-1167-1146	5	0.2	15	0.6	28	1.2	23795	1.3
1188-1175-1162-1154-1146-1167-1182-1188	12	0.5	6	0.2	6	0.2	25662	0.6
1226-1216-1203-1188-1182-1197-1209-1221-1226	21	0.8	0	0.0	5	0.2	24839	0.9
1209-1197-1182-1167-1161-1174-1209	15	0.6	44	1.7	61	2.4	25295	3.0
1174-1161-1153-1145-1138-1152-1160-1166-1148-1187-1174	18	0.6	33	1.1	101	3.4	29684	3.6
1148-1166-1160-1173-1181-1192-1202-1187-1148	10	0.4	1	0.0	49	2.1	23070	2.1
1174-1187-1202-1215-1224-1229-1226-1221-1209-1174	27	0.8	4	0.1	3	0.1	31701	0.9

5.2 Minimally Constrained Network Adjustment

A minimally constrained least squares adjustment was performed using Geolab™ (Ver. 3.65) 3-dimensional adjustment software. The geodetic latitude, longitude and ellipsoidal height of the existing NGRS control point 901 (AUS5 A) were held fixed. The adjustment comprises 264 stations and 1095 baseline vector components (365 baselines). *A priori* weights for the observations were based on the (scaled) variance-covariance sub-matrices from the GPSurvey™ solutions.

None of the standardized residuals were flagged for possible rejection under the Tau$_{max}$–test (τ_{MAX}–test), at the 0.05 level of significance. The histogram of standardized residuals indicates that the observations are well distributed. The *a posteriori* variance factor (σ_o^2= 1.0130) indicates that the scaled *a priori* standard deviations of the vector components are realistic. The absolute and relative confidence regions were not scaled by the *a posteriori* variance factor.

The relative confidence regions and the associated relative horizontal and vertical precision were computed for all pairs of points that were directly connected by vectors. All station pairings meet the horizontal positioning standard for *first order* surveys, i.e., the relative horizontal precision between each pair of points does not exceed 10 mm + 10 ppm of their horizontal separation, at the 95 percent level of confidence. The network is therefore classified as *first order* in terms of its *internal* accuracy.

5.3 Constrained Network Adjustment

A suitable subset of the recovered existing NGRS horizontal control were selected to provide a sound basis for the constrained network adjustment. Position quality and distribution were the main selection criteria.

Since the network has a high internal accuracy, and since the fit of the network to the existing control is relatively good, a strategy was devised in which the network would be constrained tightly to the existing control stations. This would further ensure a smooth integration between the newly established control and the existing NGRS framework.

The constraints assigned for the final network adjustment are shown in Table 2, which lists the standard deviations used in the adjustment. Six control points were used to constrain the network horizontally. The network was further constrained to the orthometric elevations of the six vertical control points occupied during the GPS survey. GEOID99 was incorporated into the adjustment allowing rigorous interpolation of the geoidal undulation values (*N*) at each point in the network. This provides a useful method of estimating the elevations at all points in the network.

A full listing of the constrained adjustment is contained in Appendix B. The residuals and the standardized residuals are listed in pages 25 through 68 of the adjustment results. None of the 1095 vector components were flagged for possible rejection under the τ_{MAX} - test at the 0.05 level of significance. None of the horizontal or vertical constraints were flagged (page 25). The slight increase in the *a posteriori* variance factor (σ^2_o = 1.0402) indicates that the network is not being unduly distorted by the imposition of the constraints. The absolute and relative confidence regions were not scaled by the *a posteriori* variance factor. The absolute horizontal confidence ellipses appear in pages 71 through 75. Examination of the relative precision, pages 76 through 81, reveals that the network has maintained its high internal accuracy of 10 mm + 10 ppm.

Table 3. Adjustment Constraints

(standard deviations in meters)

Horizontal

Code	Station Name	Order	ϕ	λ
901	AUS5 A	B	0.01	0.01
903	GEORGEPORT	B	0.02	0.02
907	T74 B	B	0.02	0.02
908	SWT1	B	0.02	0.02
909	50R A	B	0.02	0.02
911	BURNPORT	1	0.02	0.02

Vertical

Code	Station Name	Order	H
801	R 1307	1 - II	0.02
803	T 200	2 - 0	0.03
901	AUS5 A	1 - II	0.02
904	B 1035	1 - II	0.02
905	R 1304	1 - II	0.02
906	X 1304	1 - II	0.02

5.4 Final Coordinates and Elevations

The final NAD83 [1993] State Plane Coordinates, Texas Central [Zone 4203] are presented in US survey feet in Appendix A. Final orthometric elevations, referenced to the North American Vertical Datum of 1988, are also presented in US survey feet in Appendix A. Additional information such as the scale factor and the meridian convergence can be found in Constrained Adjustment summary in Appendix B. Appendix C contains station diagrams for the newly established control points.

APPENDIX A
FINAL COORDINATES AND ELEVATIONS

APPENDIX B
CONSTRAINED LEAST SQUARES ADJUSTMENT

APPENDIX C
STATION DIAGRAMS

Capco - Austin 2003
FINAL COORDINATES
Units: U.S. Survey Feet
Datum: NAD 83 [1993]; NAVD 88
Projection: U.S. State Plane - Texas Central Zone 4203

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1001	N 30 25 34.57837	W 98 15 31.84833	10124865.13	0.04	2950366.05	0.04	1126.68	0.09	15
1002	N 30 32 17.04378	W 98 13 23.80402	10165727.38	0.04	2960802.89	0.03	716.72	0.08	15
1003	N 30 16 52.95314	W 98 14 15.11247	10072303.47	0.04	2958075.69	0.04	1147.32	0.08	15
1004	N 30 33 33.08268	W 98 09 33.22775	10173795.93	0.03	2980812.08	0.03	868.62	0.08	15
1005	N 30 15 22.37218	W 98 09 54.63153	10063591.97	0.05	2981088.66	0.05	1251.34	0.12	15
1006	N 30 25 41.93195	W 98 08 13.34965	10126344.76	0.04	2988733.93	0.03	951.82	0.07	15
1007	N 30 41 54.07256	W 98 06 05.80760	10224757.06	0.03	2997927.36	0.03	1254.45	0.07	15
1008	N 30 17 55.72773	W 98 05 18.25404	10079562.30	0.04	3005010.20	0.03	1330.95	0.07	15
1009	N 30 9 30.36073	W 98 05 28.60034	10028499.54	0.04	3005132.33	0.04	1052.03	0.10	15
1010	N 30 41 18.60514	W 98 03 33.17035	10221444.58	0.03	3011323.22	0.03	1215.68	0.07	15
1011	N 30 39 25.58321	W 98 01 34.56521	10210242.25	0.03	3021913.19	0.03	1220.40	0.07	15
1012	N 30 30 14.91203	W 98 00 33.70454	10154733.84	0.03	3028389.62	0.03	996.04	0.07	15
1013	N 30 7 53.86683	W 98 01 02.86657	10019231.16	0.05	3028659.42	0.04	955.32	0.13	15
1014	N 30 41 42.59665	W 97 58 56.08716	10224370.67	0.04	3035458.82	0.04	1061.05	0.08	15
1015	N 30 7 02.55007	W 97 57 57.23944	10014391.11	0.04	3045067.06	0.04	963.93	0.10	15
1016	N 30 40 38.80767	W 97 53 56.90987	10218489.69	0.04	3061713.05	0.03	1033.13	0.08	15
1017	N 30 38 15.88077	W 97 49 30.20302	10204571.55	0.04	3085321.62	0.04	980.86	0.08	15
1018	N 29 58 38.17124	W 97 47 39.01470	9964645.75	0.04	3100514.53	0.04	664.18	0.07	15
1019	N 29 56 53.74486	W 97 43 33.43509	9954598.23	0.04	3122356.12	0.03	515.96	0.08	15
1020	N 29 57 28.28128	W 97 38 45.33220	9958689.56	0.03	3147612.51	0.03	540.03	0.07	15
1021	N 30 1 43.60676	W 97 34 12.10371	9985065.46	0.04	3171001.40	0.03	572.00	0.07	15
1022	N 30 33 03.50812	W 97 30 07.54249	10175461.83	0.04	3187660.57	0.04	661.00	0.07	15
1023	N 30 25 58.85394	W 97 29 01.33506	10132723.36	0.04	3194546.34	0.03	530.66	0.07	15
1024	N 30 8 42.71230	W 97 28 45.84635	10028116.45	0.04	3198587.01	0.04	547.04	0.08	15
1025	N 30 5 15.50854	W 97 29 25.73694	10007100.57	0.04	3195620.54	0.03	428.46	0.07	15
1026	N 30 10 23.43332	W 97 24 44.52383	10038838.30	0.04	3219501.59	0.04	382.66	0.08	15
1027	N 30 24 56.81685	W 97 22 46.14879	10127314.97	0.04	3227546.02	0.04	596.09	0.09	15
1028	N 30 31 49.67086	W 97 21 27.26807	10169192.35	0.04	3233334.57	0.04	508.19	0.09	15
1029	N 30 17 18.58344	W 97 20 26.79044	10081365.01	0.04	3240988.71	0.04	505.62	0.09	15
1030	N 30 28 47.63158	W 97 16 41.95038	10151485.20	0.04	3258782.35	0.04	527.09	0.09	15

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1031	N 30 20 01.92768	W 97 17 06.11201	10098338.27	0.05	3258124.16	0.04	519.63	0.10	15
1032	N 30 19 45.36422	W 98 01 14.66911	10091073.29	0.04	3026129.01	0.03	937.10	0.07	15
1033	N 30 25 26.62723	W 97 59 42.17234	10125711.00	0.03	3033508.65	0.03	838.21	0.07	15
1034	N 30 21 54.57456	W 97 59 37.31450	10104302.20	0.03	3034384.39	0.03	855.97	0.07	15
1035	N 30 18 22.29900	W 97 59 43.67522	10082850.18	0.04	3034277.95	0.03	1021.46	0.08	15
1036	N 30 13 56.37362	W 98 00 00.67688	10055959.71	0.03	3033351.39	0.03	1097.89	0.07	15
1037	N 30 23 39.13573	W 97 59 01.89452	10114928.46	0.03	3037263.53	0.03	730.96	0.07	15
1038	N 30 27 03.80218	W 97 58 37.57059	10135645.16	0.03	3038955.35	0.03	917.84	0.07	7
1039	N 30 22 28.06368	W 97 58 13.20181	10107840.39	0.03	3041679.43	0.03	806.91	0.07	15
1040	N 30 18 49.49485	W 97 58 31.68680	10085730.19	0.04	3040528.60	0.03	978.24	0.07	15
1041	N 29 56 16.74122	W 97 55 22.37370	9949454.02	0.04	3060079.18	0.04	796.89	0.07	15
1042	N 30 12 26.73866	W 97 58 34.26174	10047066.14	0.03	3041122.25	0.03	1191.16	0.07	15
1043	N 30 20 56.92372	W 97 57 46.41275	10098685.05	0.03	3044221.67	0.03	912.94	0.07	15
1044	N 30 10 31.30944	W 97 57 48.63830	10035492.53	0.03	3045373.05	0.03	976.22	0.07	15
1045	N 30 27 20.79412	W 97 56 52.73428	10137556.90	0.03	3048092.29	0.03	843.70	0.06	15
1046	N 30 22 11.88482	W 97 56 54.02354	10106354.31	0.03	3048648.51	0.03	867.60	0.07	15
1047	N 30 18 29.55779	W 97 56 53.52558	10083899.93	0.03	3049173.66	0.03	877.49	0.07	15
1048	N 30 15 32.78487	W 97 56 37.56208	10066075.62	0.03	3050956.20	0.03	895.43	0.07	7
1049	N 30 13 24.71982	W 97 57 11.82587	10053076.37	0.03	3048228.76	0.03	1111.23	0.07	7
1050	N 30 20 56.96961	W 97 56 11.48692	10098867.88	0.03	3052536.86	0.03	806.04	0.07	15
1051	N 30 28 06.73787	W 97 55 27.05258	10142358.83	0.03	3055488.99	0.03	810.64	0.06	7
1052	N 30 23 49.08534	W 97 55 22.58735	10116344.26	0.04	3056443.61	0.04	853.73	0.08	7
1053	N 30 18 28.91308	W 97 55 41.88032	10083970.01	0.03	3055453.68	0.03	897.70	0.07	7
1054	N 30 14 48.58604	W 97 55 46.07726	10061708.74	0.03	3055566.84	0.03	1098.02	0.06	7
1055	N 30 10 28.18368	W 97 55 46.01040	10035407.76	0.03	3056141.15	0.03	899.98	0.07	15
1056	N 30 31 03.48550	W 97 54 24.29951	10160329.72	0.03	3060589.71	0.03	788.09	0.06	7
1057	N 30 26 31.83022	W 97 54 49.55487	10132844.34	0.04	3058978.15	0.04	683.24	0.08	15
1058	N 30 20 57.76354	W 97 54 50.64110	10099101.40	0.03	3059617.00	0.03	810.08	0.07	7
1059	N 30 16 52.10634	W 97 54 59.99329	10074272.01	0.03	3059336.88	0.03	963.07	0.07	7
1060	N 30 28 08.19456	W 97 54 08.77322	10142654.97	0.03	3062334.34	0.03	776.03	0.06	15
1061	N 30 23 15.93335	W 97 53 50.95880	10113170.68	0.04	3064539.36	0.04	751.22	0.07	7
1062	N 30 18 27.36130	W 97 54 13.23340	10083982.13	0.03	3063225.64	0.03	830.19	0.06	7
1063	N 30 12 33.49202	W 97 54 14.68099	10048238.22	0.03	3063879.41	0.03	886.64	0.06	7
1064	N 30 7 06.86495	W 97 54 23.23196	10015231.92	0.04	3063849.12	0.03	791.72	0.07	15
1065	N 30 30 42.52337	W 97 53 08.43484	10158357.91	0.04	3067270.20	0.03	1062.88	0.07	15
1066	N 30 24 51.06178	W 97 53 07.28280	10122862.60	0.04	3068152.23	0.04	759.40	0.07	7

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1067	N 30 22 10.16724	W 97 53 26.33505	10106575.59	0.04	3066841.33	0.03	838.77	0.07	7
1068	N 30 15 23.22134	W 97 53 32.83825	10065461.40	0.03	3067173.80	0.03	969.94	0.06	7
1069	N 30 10 42.14323	W 97 53 43.72992	10037051.26	0.03	3066841.06	0.03	843.51	0.07	7
1070	N 30 19 20.18782	W 97 43 15.12634	10090624.68	0.03	3120772.28	0.03	661.04	0.06	7
1071	N 30 28 58.81372	W 97 52 28.89403	10147959.55	0.03	3070959.55	0.03	1072.14	0.06	15
1072	N 30 26 05.53874	W 97 52 37.70346	10130441.83	0.04	3070575.42	0.04	748.75	0.07	15
1073	N 30 23 37.05779	W 97 52 26.86604	10115466.27	0.03	3071855.48	0.03	944.85	0.07	7
1074	N 30 19 35.14940	W 97 52 44.08516	10091000.26	0.03	3070887.01	0.03	773.07	0.07	7
1075	N 30 13 47.32595	W 97 52 50.25394	10055858.05	0.03	3071121.22	0.03	923.37	0.06	7
1076	N 30 8 53.18819	W 97 53 01.09687	10026128.85	0.04	3070824.56	0.04	799.92	0.09	7
1077	N 30 5 43.28960	W 97 53 27.05388	10006898.62	0.04	3068967.27	0.03	879.19	0.07	15
1078	N 30 2 32.53951	W 97 53 05.93959	9987673.16	0.04	3071245.79	0.04	828.40	0.09	15
1079	N 29 59 37.83702	W 97 54 32.80786	9969860.36	0.04	3063996.81	0.04	762.07	0.09	7
1080	N 29 55 56.84936	W 97 53 13.47322	9947692.43	0.04	3071462.79	0.04	630.36	0.06	7
1081	N 30 32 50.01857	W 97 51 32.67577	10171420.11	0.03	3075357.76	0.03	1101.09	0.06	15
1082	N 30 21 22.69782	W 97 51 18.51113	10102028.85	0.03	3078142.72	0.03	807.94	0.07	7
1083	N 30 17 21.19659	W 97 52 09.68793	10077537.67	0.03	3074200.51	0.03	845.47	0.06	7
1084	N 30 11 08.68929	W 97 52 14.57216	10039904.79	0.04	3074605.44	0.03	809.07	0.07	7
1085	N 29 59 52.51833	W 97 53 07.49791	9971507.50	0.04	3071464.58	0.04	780.48	0.08	n/a
1086	N 30 33 26.07406	W 97 50 43.57085	10175157.43	0.03	3079568.87	0.03	995.50	0.06	15
1087	N 30 30 29.17204	W 97 50 54.41062	10157269.32	0.04	3079020.57	0.03	1007.19	0.06	15
1088	N 30 27 09.46405	W 97 50 54.87956	10137098.11	0.03	3079430.17	0.03	877.77	0.06	15
1089	N 30 23 56.63111	W 97 51 03.11232	10117606.07	0.03	3079144.49	0.03	1057.62	0.07	7
1090	N 30 18 52.37249	W 97 51 17.67661	10086847.70	0.04	3078554.14	0.04	852.91	0.09	7
1091	N 30 14 05.95994	W 97 51 04.74517	10057945.37	0.03	3080332.83	0.03	808.84	0.07	7
1092	N 30 7 49.33372	W 97 51 29.42291	10019857.64	0.04	3079015.13	0.04	703.01	0.09	15
1093	N 30 3 22.71632	W 97 51 44.59248	9992899.21	0.04	3078281.58	0.03	781.78	0.08	15
1094	N 29 57 48.33838	W 97 51 48.18220	9959119.08	0.04	3078716.18	0.04	693.54	0.07	7
1095	N 30 32 05.21692	W 97 50 08.40969	10167059.84	0.04	3082825.59	0.03	985.27	0.06	15
1096	N 30 26 10.94716	W 97 50 20.29337	10131255.71	0.04	3082589.08	0.03	1019.00	0.08	15
1097	N 30 11 26.09875	W 97 50 42.66622	10041842.63	0.04	3082630.35	0.03	793.40	0.07	7
1098	N 30 5 12.47293	W 97 50 56.04909	10004079.83	0.04	3082299.07	0.03	687.99	0.07	15
1099	N 30 30 48.61393	W 97 49 34.33260	10159390.08	0.04	3085979.25	0.03	947.36	0.07	15
1100	N 30 27 21.03576	W 97 49 32.65531	10138428.30	0.03	3086598.60	0.03	1032.33	0.06	15
1101	N 30 21 50.35538	W 97 49 34.51399	10105026.37	0.03	3087188.80	0.03	900.33	0.07	7
1102	N 30 17 46.27376	W 97 49 45.67054	10080352.36	0.03	3086766.68	0.03	912.09	0.06	7

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1103	N 30 12 41.98099	W 97 49 56.82782	10049596.93	0.03	3086479.87	0.03	719.39	0.07	n/a
1104	N 30 9 34.62740	W 97 49 59.56858	10030668.80	0.04	3086664.80	0.03	678.18	0.07	7
1105	N 30 7 03.50922	W 97 50 08.23122	10015388.68	0.04	3086247.27	0.04	702.49	0.09	7
1106	N 30 1 00.52081	W 97 50 20.51638	9978702.07	0.04	3085990.75	0.04	720.62	0.07	15
1107	N 30 23 00.06270	W 97 49 06.48194	10112122.14	0.03	3089484.72	0.03	760.29	0.07	7
1108	N 30 15 58.85838	W 97 49 04.32431	10069585.28	0.03	3090635.78	0.03	761.73	0.07	7
1109	N 30 14 03.93315	W 97 49 14.96936	10057956.82	0.03	3089964.74	0.03	712.97	0.06	n/a
1110	N 30 26 48.80669	W 97 48 13.83055	10135329.41	0.03	3093569.68	0.03	992.31	0.06	7
1111	N 30 20 21.58953	W 97 48 14.25360	10096220.32	0.03	3094422.05	0.04	673.26	0.07	7
1112	N 30 16 47.52471	W 97 48 27.66561	10074573.36	0.03	3093738.06	0.03	761.88	0.06	7
1113	N 30 11 47.83330	W 97 48 33.42387	10044293.32	0.03	3093920.21	0.03	740.97	0.06	n/a
1114	N 30 8 41.12878	W 97 48 39.24870	10025424.61	0.04	3093836.83	0.04	661.62	0.08	7
1115	N 30 5 40.45046	W 97 48 40.70123	10007173.14	0.03	3094123.13	0.03	685.67	0.07	15
1116	N 30 3 31.71029	W 97 48 43.25526	9994165.19	0.04	3094193.58	0.03	783.48	0.07	15
1117	N 30 24 19.29719	W 97 47 20.46750	10120335.79	0.04	3098584.72	0.03	673.32	0.07	7
1118	N 30 18 16.60518	W 97 47 43.53669	10083658.41	0.04	3097401.02	0.04	599.04	0.08	7
1119	N 30 28 22.30816	W 97 46 49.59460	10144941.25	0.04	3100724.10	0.04	892.05	0.07	7
1120	N 30 26 26.38751	W 97 46 41.26697	10133250.27	0.03	3101721.60	0.03	938.55	0.06	7
1121	N 30 22 36.42003	W 97 46 48.57692	10110009.40	0.03	3101615.06	0.04	605.86	0.07	7
1122	N 30 20 29.81064	W 97 46 51.89731	10097215.45	0.03	3101617.73	0.03	619.45	0.06	7
1123	N 30 17 42.14433	W 97 46 45.94337	10080293.46	0.04	3102528.15	0.03	545.45	0.07	7
1124	N 30 15 59.51404	W 97 46 58.75012	10069902.22	0.03	3101643.40	0.03	552.29	0.06	7
1125	N 30 13 43.33295	W 97 47 04.51584	10056136.53	0.03	3101453.10	0.03	696.32	0.06	7
1126	N 30 10 16.44724	W 97 47 08.56045	10035233.16	0.03	3101577.00	0.03	689.88	0.06	7
1127	N 30 6 46.25678	W 97 47 15.86611	10013989.32	0.03	3101421.76	0.03	655.34	0.07	15
1128	N 30 2 51.25331	W 97 47 21.06492	9990243.44	0.04	3101508.19	0.03	632.01	0.07	15
1129	N 30 16 46.55155	W 97 46 08.85414	10074753.50	0.03	3105908.24	0.03	490.17	0.06	7
1130	N 30 12 39.35741	W 97 46 16.85918	10049771.13	0.03	3105781.63	0.03	594.54	0.06	7
1131	N 30 8 20.42023	W 97 46 22.99951	10023606.34	0.03	3105845.02	0.03	586.24	0.06	7
1132	N 30 27 41.30231	W 97 45 02.24670	10141016.59	0.03	3110211.30	0.03	875.91	0.06	7
1133	N 30 23 19.59795	W 97 45 05.29600	10114579.04	0.03	3110558.09	0.03	794.03	0.07	7
1134	N 30 18 01.01091	W 97 45 31.36228	10082349.64	0.03	3109020.61	0.03	572.85	0.05	7
1135	N 30 15 37.25669	W 97 45 30.48692	10067832.56	0.03	3109433.44	0.03	452.65	0.06	n/a
1136	N 30 6 14.65448	W 97 45 49.18732	10010972.53	0.03	3109106.71	0.03	726.79	0.07	15
1137	N 30 25 49.00585	W 97 44 25.31540	10129750.20	0.03	3113706.92	0.03	836.06	0.06	7
1138	N 30 12 55.27373	W 97 45 00.12594	10051534.34	0.03	3112475.33	0.03	658.71	0.06	7

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1139	N 30 9 37.35238	W 97 45 02.57070	10031539.63	0.03	3112725.06	0.03	574.70	0.06	7
1140	N 30 2 55.10059	W 97 45 14.60957	9990887.94	0.04	3112610.62	0.03	682.73	0.07	15
1141	N 30 36 12.34318	W 97 43 29.41393	10192819.45	0.04	3117122.93	0.04	898.82	0.06	15
1142	N 30 33 14.13082	W 97 43 31.40454	10174816.55	0.04	3117371.07	0.03	881.99	0.05	15
1143	N 30 27 16.18813	W 97 43 15.87971	10138697.49	0.04	3119577.14	0.03	838.98	0.06	7
1144	N 30 22 44.56838	W 97 43 40.42687	10111214.45	0.03	3118071.94	0.03	773.91	0.07	7
1145	N 30 11 13.55120	W 97 44 28.74931	10041324.60	0.03	3115466.98	0.03	546.41	0.07	7
1146	N 30 7 39.06353	W 97 44 19.70458	10019680.18	0.03	3116765.92	0.03	648.41	0.06	7
1147	N 30 4 28.88460	W 97 44 36.84510	10000437.20	0.03	3115708.32	0.03	677.61	0.07	15
1148	N 30 11 10.98359	W 97 39 39.51471	10041665.87	0.03	3140850.80	0.03	478.90	0.06	n/a
1149	N 30 30 33.92192	W 97 42 47.73167	10158725.78	0.04	3121569.59	0.04	779.74	0.06	15
1150	N 30 25 47.27432	W 97 43 23.07932	10129702.73	0.03	3119157.94	0.03	818.35	0.06	7
1152	N 30 12 51.72799	W 97 43 45.19925	10051329.50	0.03	3119055.95	0.03	625.54	0.06	7
1153	N 30 9 30.85523	W 97 43 42.27893	10031047.77	0.03	3119787.27	0.03	651.82	0.06	7
1154	N 30 5 28.14600	W 97 43 39.69310	10006539.80	0.03	3120588.51	0.03	652.17	0.06	15
1155	N 30 23 11.81322	W 97 42 20.49847	10114130.74	0.03	3125005.98	0.03	757.69	0.07	7
1156	N 30 15 37.23412	W 97 42 39.18076	10068181.20	0.03	3124452.70	0.03	463.16	0.06	7
1157	N 30 24 53.64564	W 97 41 48.46218	10124481.78	0.03	3127567.26	0.03	737.54	0.06	7
1158	N 30 22 03.64550	W 97 41 35.61068	10107339.15	0.04	3129099.76	0.03	695.01	0.08	7
1159	N 30 16 59.84424	W 97 42 01.66641	10076602.25	0.03	3127544.22	0.03	531.81	0.06	7
1160	N 30 12 52.26792	W 97 42 09.73244	10051581.09	0.03	3127428.63	0.03	579.22	0.06	7
1161	N 30 8 47.53483	W 97 42 07.77450	10026867.75	0.03	3128185.12	0.03	545.94	0.06	7
1162	N 30 5 28.41061	W 97 42 12.46220	10006746.85	0.03	3128249.18	0.03	605.06	0.06	15
1163	N 30 22 09.59998	W 97 40 53.54077	10108028.18	0.04	3132769.74	0.03	745.59	0.07	7
1164	N 30 19 19.26814	W 97 41 08.14619	10090794.89	0.03	3131900.21	0.03	629.96	0.05	7
1165	N 30 14 59.69007	W 97 41 20.96965	10064551.74	0.03	3131399.92	0.03	465.15	0.06	7
1166	N 30 11 15.98045	W 97 41 36.92583	10041924.53	0.03	3130537.09	0.03	517.53	0.07	7
1167	N 30 7 10.93032	W 97 41 26.63646	10017196.53	0.03	3132027.92	0.03	603.84	0.06	7
1168	N 30 35 01.91123	W 97 40 16.17538	10186106.16	0.04	3134174.99	0.03	914.84	0.05	15
1169	N 30 31 06.16758	W 97 40 03.41260	10162323.89	0.04	3135860.85	0.03	719.37	0.05	15
1170	N 30 25 45.20176	W 97 40 16.53241	10129880.39	0.03	3135489.55	0.03	789.34	0.06	7
1171	N 30 23 48.34082	W 97 40 21.93396	10118066.66	0.03	3135299.14	0.03	676.67	0.06	7
1172	N 30 17 11.77278	W 97 40 32.99564	10077991.84	0.03	3135287.69	0.03	546.42	0.06	7
1173	N 30 13 21.21836	W 97 40 35.96231	10054700.49	0.03	3135583.87	0.03	480.64	0.06	7
1174	N 30 9 19.44316	W 97 40 26.42082	10030301.99	0.03	3137004.59	0.03	565.37	0.07	7
1175	N 30 5 32.89988	W 97 40 44.90090	10007382.94	0.03	3135928.64	0.03	586.41	0.06	15

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1176	N 30 20 47.61313	W 97 39 36.40153	10099909.61	0.03	3139724.19	0.03	612.50	0.06	7
1177	N 30 18 35.66753	W 97 39 43.04610	10086569.72	0.03	3139462.23	0.03	549.58	0.05	7
1178	N 30 14 48.56230	W 97 39 36.37710	10063647.11	0.03	3140597.92	0.03	445.56	0.06	7
1179	N 30 24 39.43091	W 97 38 58.61059	10123401.76	0.03	3142469.54	0.04	753.76	0.06	7
1180	N 30 16 54.67086	W 97 39 03.86846	10076452.15	0.03	3143141.29	0.03	448.69	0.06	7
1181	N 30 12 22.37991	W 97 38 41.77695	10048998.71	0.03	3145742.42	0.03	466.30	0.07	7
1182	N 30 8 00.49518	W 97 39 01.15318	10022508.25	0.03	3144680.75	0.03	490.91	0.07	7
1183	N 30 26 53.15016	W 97 38 12.71068	10137003.86	0.03	3146160.02	0.03	784.35	0.05	15
1184	N 30 22 52.91184	W 97 38 25.29688	10112714.39	0.03	3145646.18	0.03	696.07	0.06	7
1185	N 30 19 48.13906	W 97 38 17.86634	10094069.06	0.03	3146749.01	0.03	602.37	0.05	7
1186	N 30 14 01.93699	W 97 38 20.54689	10059098.61	0.03	3147361.19	0.03	442.14	0.06	7
1187	N 30 10 36.74209	W 97 38 20.20734	10038375.50	0.03	3147893.02	0.03	443.67	0.06	7
1188	N 30 5 34.45599	W 97 38 38.93516	10007805.85	0.03	3146987.86	0.03	556.49	0.06	15
1189	N 30 25 05.96053	W 97 37 17.09182	10126296.66	0.04	3151290.76	0.04	681.47	0.07	15
1190	N 30 21 45.81734	W 97 37 38.76005	10106037.12	0.04	3149885.94	0.04	643.86	0.08	7
1191	N 30 16 16.29010	W 97 37 54.35220	10072723.36	0.03	3149328.78	0.03	513.16	0.06	7
1192	N 30 11 57.57097	W 97 37 53.16213	10046596.46	0.03	3150067.88	0.03	451.45	0.07	7
1193	N 30 32 00.43156	W 97 36 20.24430	10168277.35	0.04	3155239.94	0.04	651.82	0.07	15
1194	N 30 19 58.09606	W 97 36 55.02649	10095251.27	0.03	3153981.98	0.03	595.72	0.05	7
1196	N 30 13 39.58311	W 97 37 03.60891	10057005.08	0.03	3154163.52	0.03	432.25	0.06	7
1197	N 30 8 30.28621	W 97 36 56.90958	10025781.83	0.03	3155514.32	0.03	603.54	0.07	7
1198	N 30 27 10.89356	W 97 35 49.62048	10139101.63	0.04	3158636.61	0.03	680.73	0.06	15
1199	N 30 23 55.29069	W 97 36 00.09152	10119324.44	0.03	3158205.91	0.03	620.51	0.06	7
1200	N 30 21 28.83074	W 97 36 14.87773	10104501.07	0.03	3157274.40	0.03	595.73	0.06	7
1201	N 30 15 11.98888	W 97 36 13.57278	10066445.00	0.03	3158322.74	0.03	439.55	0.06	7
1202	N 30 11 12.48819	W 97 36 09.99244	10042264.36	0.03	3159230.52	0.03	492.73	0.06	7
1203	N 30 6 05.34384	W 97 36 28.33855	10011204.61	0.04	3158381.01	0.03	580.93	0.07	15
1204	N 30 23 25.73205	W 97 35 02.78659	10116462.86	0.03	3163296.54	0.03	635.14	0.06	7
1205	N 30 20 31.98731	W 97 35 07.69978	10098905.12	0.03	3163299.90	0.03	586.85	0.06	7
1206	N 30 18 58.94321	W 97 35 14.03418	10089494.54	0.03	3162977.04	0.03	625.69	0.06	7
1207	N 30 17 18.15826	W 97 35 20.39684	10079302.11	0.03	3162670.70	0.03	498.18	0.06	7
1209	N 30 9 05.65251	W 97 35 08.72880	10029586.97	0.03	3164922.16	0.03	513.15	0.07	7
1210	N 30 34 16.92762	W 97 34 26.50631	10182307.80	0.04	3164841.35	0.04	726.50	0.07	15
1211	N 30 30 56.44278	W 97 34 22.93936	10162067.95	0.04	3165655.59	0.04	672.84	0.07	15
1212	N 30 27 53.89964	W 97 34 43.52579	10143587.70	0.04	3164312.11	0.03	665.46	0.06	15
1213	N 30 25 00.93378	W 97 34 33.59056	10126140.87	0.03	3165614.38	0.03	630.13	0.06	15

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1214	N 30 14 53.63235	W 97 34 44.56001	10064783.50	0.03	3166173.14	0.03	428.29	0.06	7
1215	N 30 11 21.73048	W 97 34 51.87422	10043366.72	0.03	3166061.40	0.03	487.67	0.06	7
1216	N 30 6 44.23709	W 97 35 06.65889	10015309.16	0.04	3165456.75	0.03	565.06	0.07	15
1217	N 30 22 00.78058	W 97 33 59.49482	10108020.76	0.03	3169051.38	0.03	567.21	0.06	15
1218	N 30 20 51.60044	W 97 33 56.31904	10101040.96	0.03	3169503.37	0.03	519.06	0.06	15
1219	N 30 18 05.88394	W 97 33 55.85734	10084305.70	0.03	3169960.31	0.03	456.44	0.06	7
1220	N 30 13 19.44573	W 97 34 05.24454	10055356.76	0.03	3169856.92	0.03	405.82	0.06	7
1221	N 30 8 34.53760	W 97 34 10.99204	10026570.08	0.03	3170067.83	0.03	523.47	0.07	15
1222	N 30 24 12.38287	W 97 33 04.40723	10121431.98	0.04	3173543.18	0.03	588.98	0.08	15
1223	N 30 15 22.50497	W 97 33 13.69621	10067897.66	0.03	3174067.42	0.03	418.16	0.06	15
1224	N 30 11 13.32165	W 97 33 21.39250	10042714.83	0.03	3174021.11	0.04	484.08	0.07	7
1225	N 30 20 34.09881	W 97 32 23.96696	10099475.66	0.03	3177637.05	0.03	505.64	0.06	15
1226	N 30 8 08.75218	W 97 33 11.26058	10024096.57	0.03	3175376.03	0.03	513.92	0.07	15
1227	N 30 18 02.97297	W 97 31 42.87743	10084303.66	0.03	3181621.23	0.03	597.99	0.06	15
1228	N 30 15 11.45258	W 97 31 57.22788	10066949.64	0.03	3180799.87	0.03	418.61	0.06	15
1229	N 30 10 47.55112	W 97 32 09.07842	10040271.18	0.03	3180431.23	0.03	414.05	0.07	15
1230	N 30 14 05.30334	W 97 31 07.96944	10060378.06	0.03	3185287.76	0.03	409.44	0.06	15
1231	N 30 19 55.68996	W 97 30 15.03020	10095882.16	0.03	3189030.03	0.03	500.06	0.07	15
1232	N 30 16 45.72579	W 97 30 27.96371	10076668.48	0.03	3188384.39	0.03	570.92	0.06	15
1233	N 30 18 03.33150	W 97 29 36.05418	10084621.91	0.03	3192734.28	0.03	570.80	0.07	15
1234	N 30 19 29.99919	W 97 28 53.07056	10093471.00	0.03	3196276.62	0.03	470.26	0.07	15
1235	N 30 15 35.81464	W 97 28 56.27678	10069813.12	0.04	3196602.00	0.03	550.66	0.07	15
1236	N 30 35 46.25089	W 97 27 41.79913	10192223.93	0.04	3199975.01	0.04	617.59	0.07	7
1237	N 30 33 00.94936	W 97 27 12.50534	10175596.24	0.04	3202966.52	0.03	622.23	0.07	15
1238	N 30 34 03.97048	W 97 26 01.61501	10182121.73	0.04	3208996.81	0.04	553.68	0.08	7
1239	N 30 36 28.95724	W 97 25 11.33458	10196878.73	0.04	3213007.21	0.04	606.85	0.08	7
1240	N 30 32 24.58301	W 97 25 03.15869	10172218.20	0.04	3214368.42	0.03	607.90	0.07	15
1241	N 30 35 06.69493	W 97 24 20.78710	10188687.06	0.04	3217641.35	0.04	588.15	0.08	7
1242	N 30 33 17.20662	W 97 24 34.62362	10177598.10	0.04	3216723.09	0.04	586.59	0.08	7
1243	N 30 33 54.88798	W 97 24 01.21894	10181480.39	0.04	3219542.33	0.04	525.88	0.08	7
1244	N 30 35 45.75684	W 97 22 59.47426	10192819.61	0.04	3224641.26	0.04	591.79	0.08	7
1245	N 30 33 26.17908	W 97 22 26.82227	10178799.65	0.04	3227868.89	0.04	519.48	0.08	7
1246	N 30 21 26.39161	W 97 59 36.97326	10101456.29	0.04	3034474.15	0.03	894.93	0.07	n/a
1247	N 30 25 29.61982	W 97 56 07.38482	10126413.54	0.04	3052302.49	0.03	773.09	0.07	15
1248	N 30 16 55.15722	W 97 45 27.89656	10075705.61	0.03	3109478.36	0.03	559.60	0.06	7
1249	N 30 16 46.10854	W 97 43 55.38575	10074980.43	0.03	3117608.78	0.03	549.08	0.06	7

Point	Latitude	Longitude	Northing	Std. Dev. (northing)	Easting	Std. Dev. (easting)	Height	Std. Dev. (height)	Panel (feet)
1250	N 30 33 54.61755	W 97 49 13.51342	10178217.24	0.04	3087375.37	0.03	938.23	0.07	15
1251	N 30 32 36.76114	W 97 48 01.28031	10170497.10	0.04	3093867.57	0.03	886.73	0.06	15
1252	N 30 30 12.93911	W 97 48 35.35884	10155903.62	0.04	3091218.04	0.04	890.26	0.07	7
1253	N 30 36 05.47916	W 97 34 28.67869	10193266.06	0.04	3164379.58	0.04	768.17	0.07	7
801	N 29 55 04.99334	W 97 54 32.40295	9942302.66	0.04	3064633.09	0.04	671.19	0.05	n/a
803	N 30 35 09.33542	W 97 51 20.57921	10185514.53	0.04	3076101.75	0.03	967.15	0.06	n/a
901	N 30 18 50.68871	W 97 45 07.89472	10087414.65	0.03	3110960.84	0.03	628.96	0.05	n/a
903	N 30 40 46.10044	W 97 40 49.68787	10220797.83	0.04	3130417.53	0.03	767.47	0.06	n/a
904	N 30 40 23.17009	W 97 35 55.50363	10219103.97	0.04	3156154.48	0.04	671.98	0.05	n/a
905	N 30 34 38.72894	W 97 41 27.43014	10183616.36	0.03	3128004.38	0.03	815.15	0.04	n/a
906	N 30 28 09.63110	W 97 40 14.72910	10144470.84	0.04	3135298.17	0.03	814.27	0.05	n/a
907	N 30 34 22.18470	W 97 26 33.86200	10183887.83	0.04	3206130.94	0.03	567.14	0.08	n/a
908	N 29 53 17.25077	W 97 56 56.84453	9931145.26	0.04	3052157.13	0.04	767.77	0.11	n/a
909	N 29 51 01.87776	W 97 40 18.88457	9919464.73	0.04	3140318.68	0.03	524.57	0.09	n/a
911	N 30 44 25.72071	W 98 14 15.54326	10239243.05	0.03	2954892.55	0.03	1266.30	0.08	n/a
9195	N 30 16 57.67911	W 97 36 48.84533	10077043.39	0.03	3154969.07	0.03	565.06	0.06	n/a
9222	N 30 24 36.75603	W 97 33 42.86085	10123809.46	0.03	3170115.57	0.03	604.61	0.06	n/a
9901	N 30 18 52.35114	W 97 45 09.97688	10087578.32	0.03	3110774.49	0.03	637.77	0.05	n/a

B.2) Field Survey Notes and Sketches

COOL

PROJECT: WALLER CREEK STRUCTURE NAME WC1 - BR

STREAM NAME: WALLER CREEK DATE: 09-24-07

LOCATION: PEDESTRIAN BRIDGE +/- 200' US OF TOWNLAKE CREW MOSELEY REED McCRANEY

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1004

BRIDGE RAIL 3.5 DECK 5.2 WIDTH 6' PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

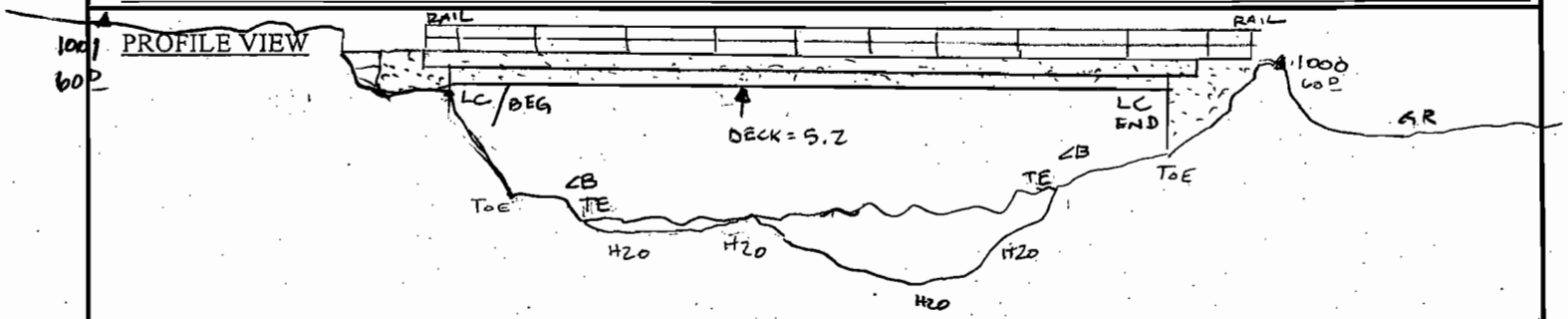
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

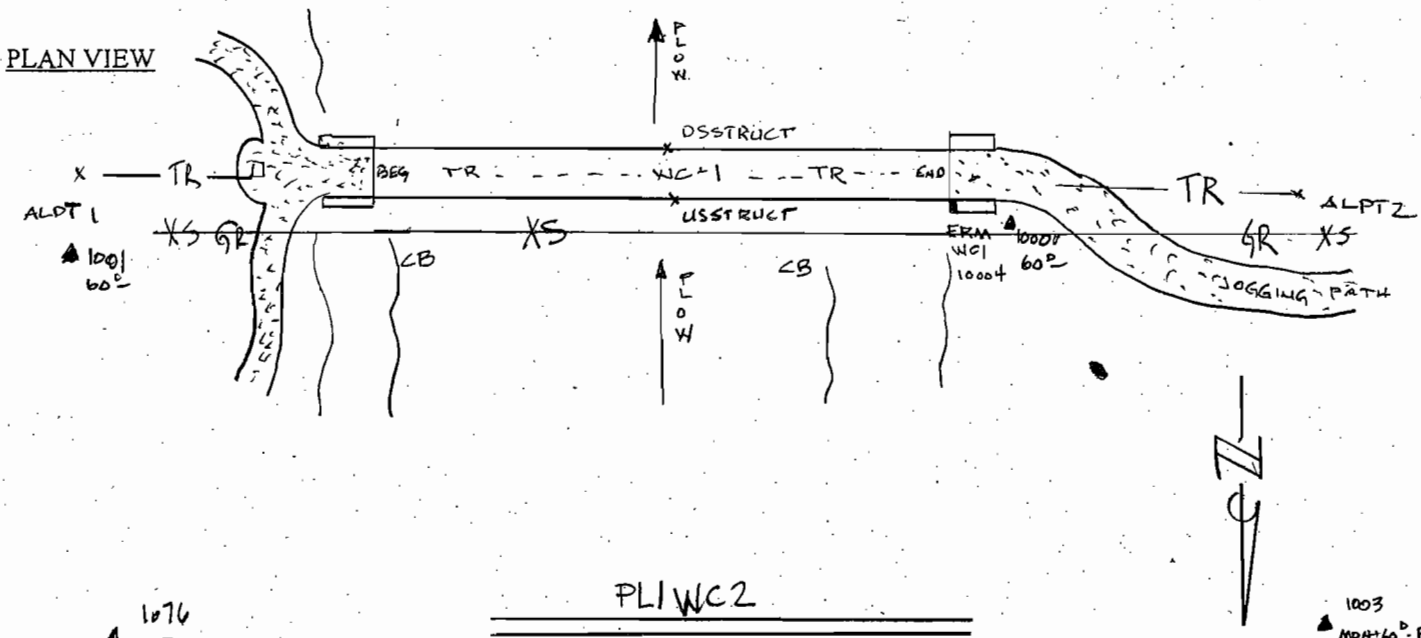
ERM DESCRIPTION: "□" CUT ON US RIGHT ABUTMENT # 1004

ADDL COMMENTS PEDESTRIAN BRIDGE SHOTS 1004-1057

PROFILE VIEW



PLAN VIEW



PL1WC2

1076
TPT+60D-S

1003
MDA+60D-F

T@1000: BS 1001 — VD = 4.94
HI = 5.20 HT = 5.43

1002 5.43 CHK+ 1001 ⟨ERR .012 .002⟩
SEE BACK FOR ∠ & HD TO TPT 1003
10004 - ERM BR WC1
10058 5.43 CHK+ 1001 ⟨ERR. 6.016 0.002⟩

GOOD

PROJECT: WALLER CREEK STRUCTURE NAME WC2 - PL 48

STREAM NAME: WALLER CREEK DATE: 09-24-07

LOCATION: +/- 400' US OF TOWNLAKE CREW MOSELEY REED M^C GRANLEY

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1060

BRIDGE RAIL — DECK — WIDTH — PIER(s) 3 @ 1.5 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

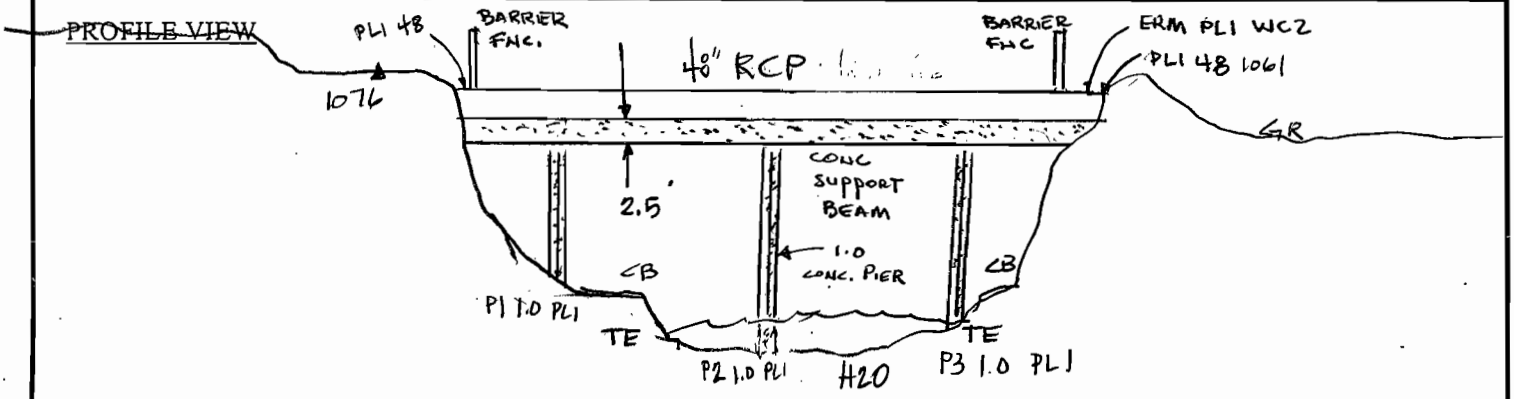
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

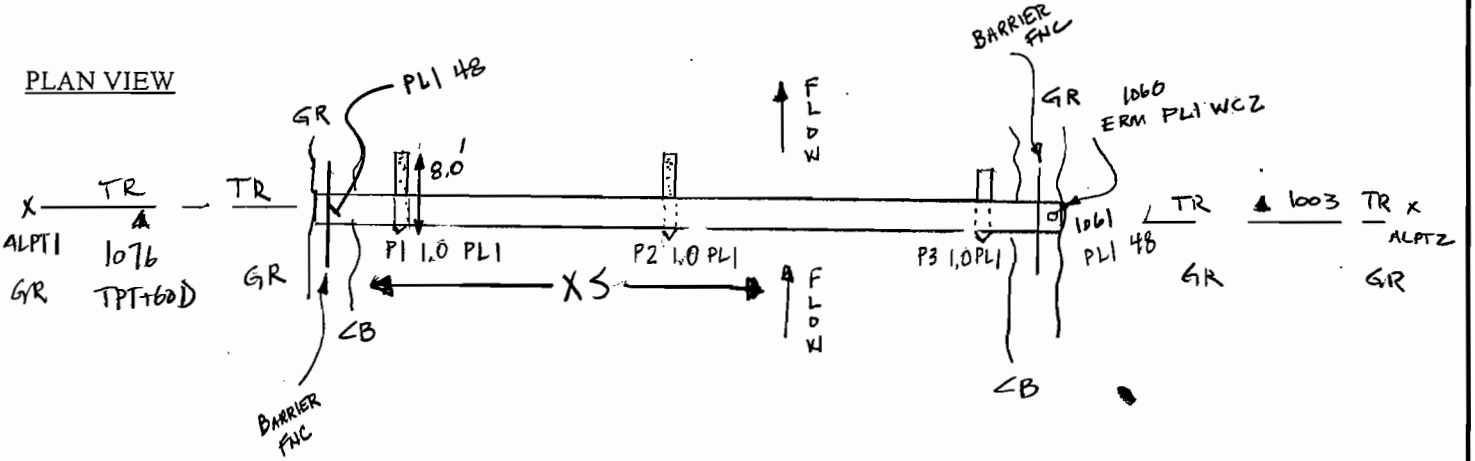
ERM DESCRIPTION: □ CUT ON US RIGHT TOP PIPE @ GR

ADDL COMMENTS 48" RCP PIPELINE XING +/- 200' US OF WC1
W/ 2.5 HIGH CONC. SUPP. BEAM

PROFILE VIEW



PLAN VIEW



T @ 1003 BS 1000
HI = 5.14 HT = 5.06
1059 5.06 CHK+1000 ⟨ERR, 0.009 0.063⟩
1060 5.80 ERM PL WC2
1074 5.06 CHK+1000 ⟨ERR 0.011 0.074⟩

T @ 1001 ; BS 1000
HI=5.56 HT=5.06
1075 5.06 CHK+1060 ⟨ERR, 0.016 0.024⟩
1076 5.12 TPT+60D-S set on Back
1077 5.06 CHK+1000 ⟨ERR 0.016 0.035⟩

T @ 1076 BS 1001
HI = 5.21 HT = 5.43
1078 5.43 CHK+1001
1100 5.43 CHK+1001 ⟨0.007 0.059⟩

600P

PROJECT: WALLER CREEK STRUCTURE NAME WC3-BR

STREAM NAME: WALLER CREEK DATE: 09-24-07

LOCATION: CESAR CHAVEZ CREW MOSELEY REED McCRANEY

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1104

BRIDGE RAIL 3.5 DECK 4.2 WIDTH _____ PIER(s) ____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

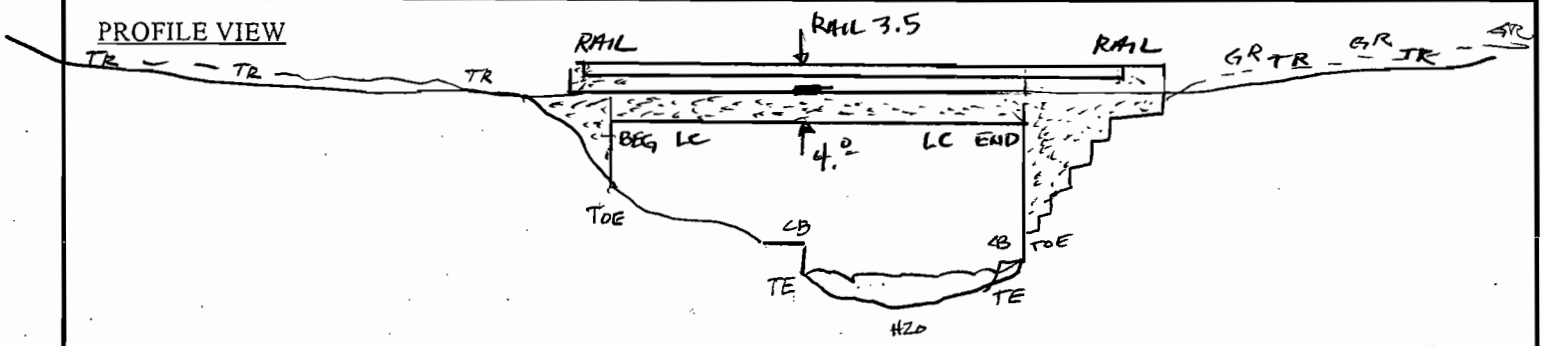
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

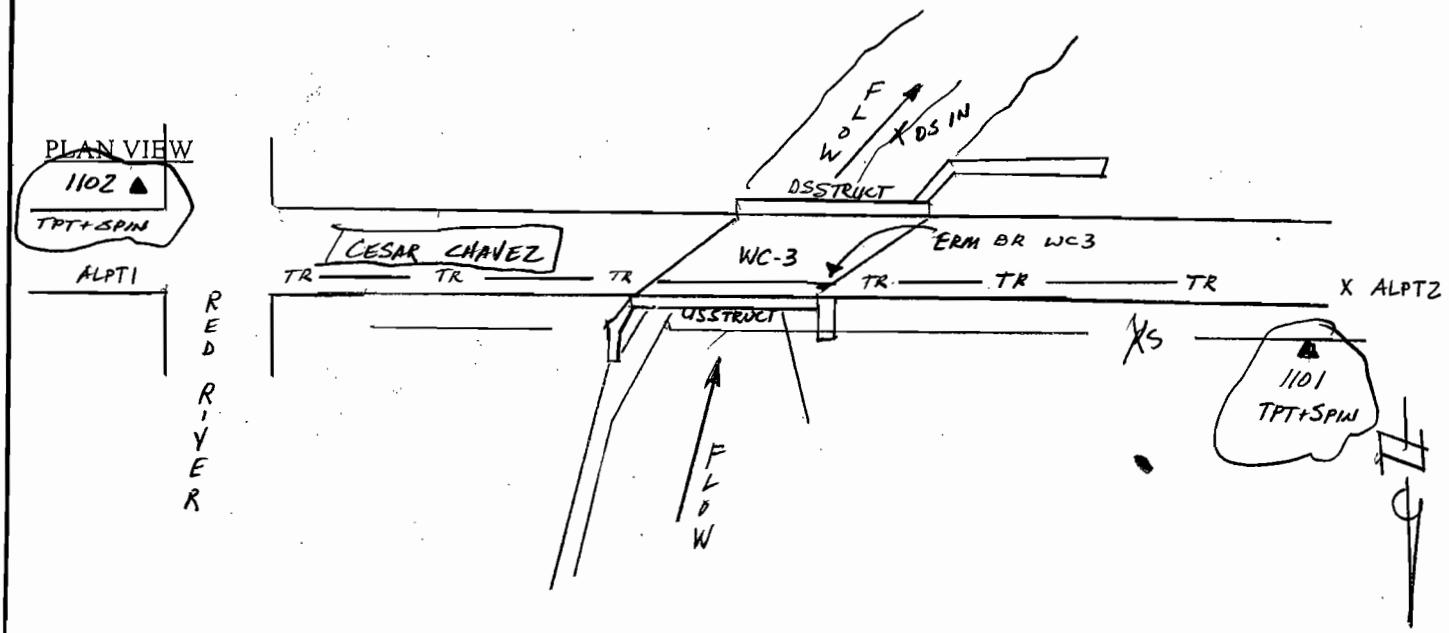
ERM DESCRIPTION: D CUT ON US RIGHT BACK CURB @ ABUTMENT

ADDL COMMENTS SHOTS 1104 - 1148

PROFILE VIEW



PLAN VIEW



T@1101 BS 1102
HI = 5.25 HT = 5.48

1103 5.48 CHK+ 1102 <ERR. 0.001 0.006>
1104 5.80 ERM BR WC3
1148

LEVEL Loop 1101-1102 on Back

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC-4

STREAM NAME: WALLER CREEK DATE: 09-27-07

LOCATION: RED RIVER CREW MOSELEY REED EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1163

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

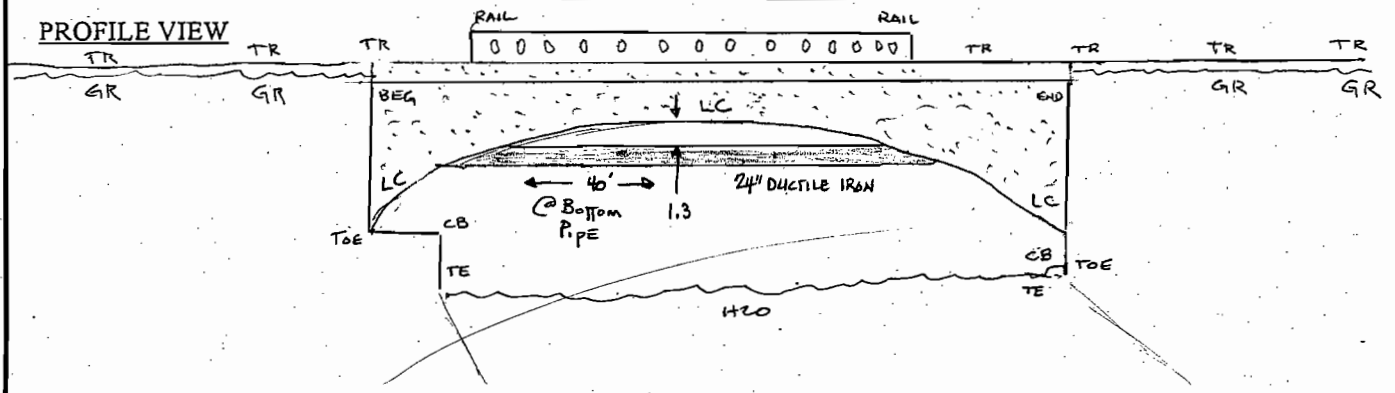
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

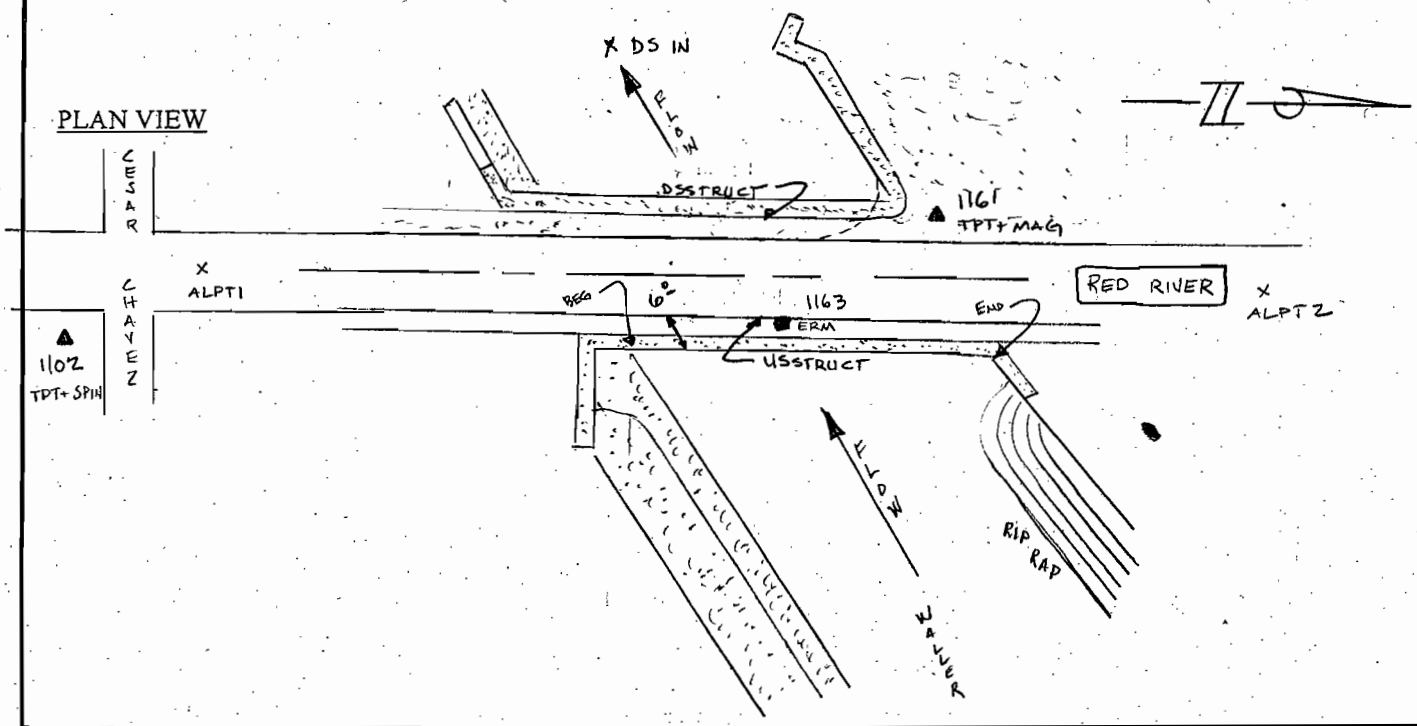
ERM DESCRIPTION: "D" FND ON BACK CURB @ SW US SIDE RED RIVER @ MID PT BRIDGE

ADDL COMMENTS USED COORDS ESTABLISHED FOR 1102 @ WC3 SHOTS 1162 - 1209

PROFILE VIEW



PLAN VIEW



T @ 1161 BS 1102 BSD 407.34

HI = 5.43 HT = 5.26

1162 5.26 CHK+ 1102 ⟨ERR. 0.011 0.013⟩

1163-1208 TOPO

1209 5.26 CHK+ 1102 ⟨ERR. ⟩

10364.18
407.34
10771.52

6001

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC5

STREAM NAME: Waller Creek DATE: 09-27-07

LOCATION: 3RD St. CREW Moseley Reed Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1213

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) 2 @ _____ PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

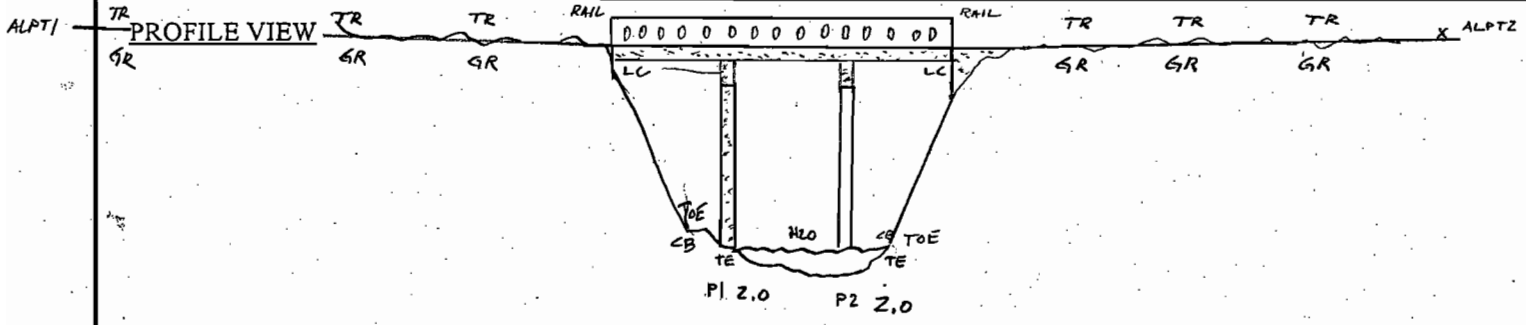
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

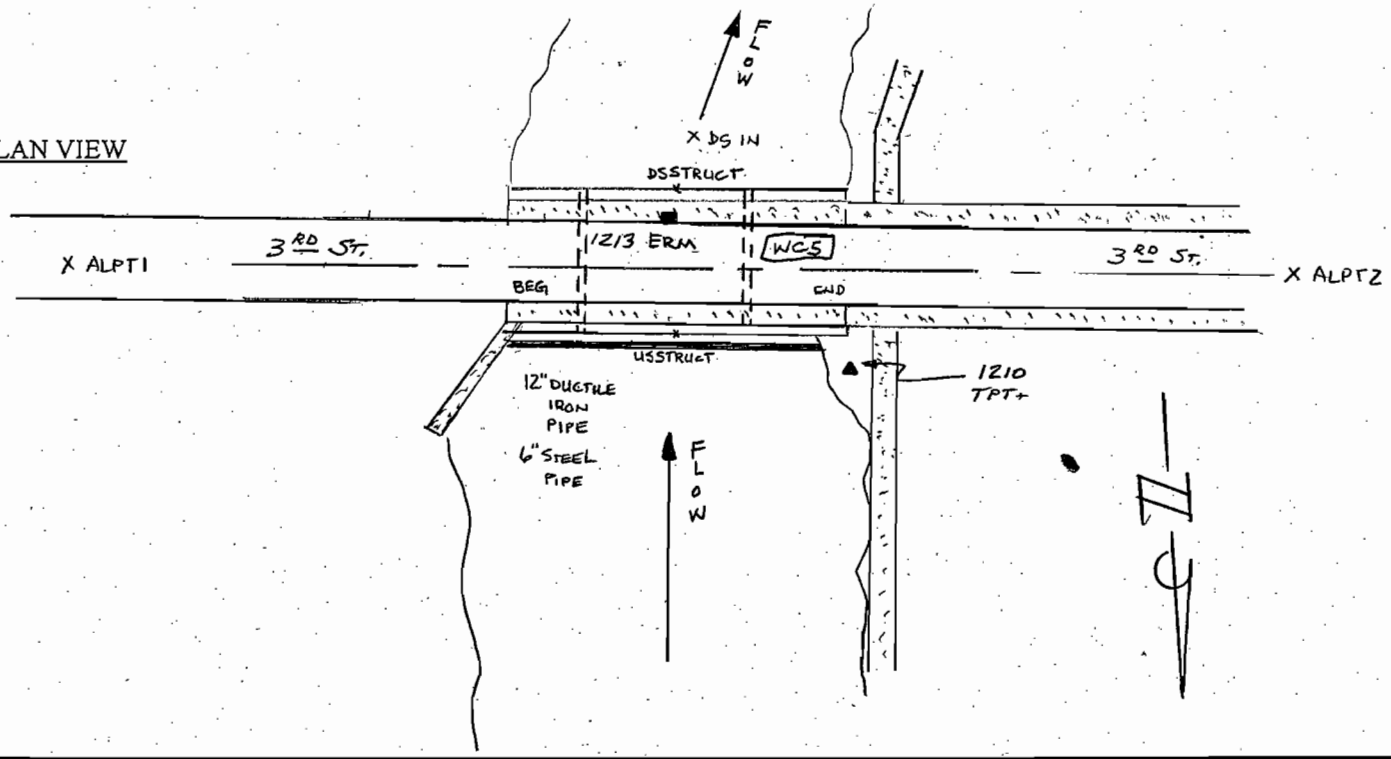
ERM DESCRIPTION: "□" CUT ON DS BACK CRB @ MID PT BRIDGE

ADDL COMMENTS SHOTS 1213 – 1264

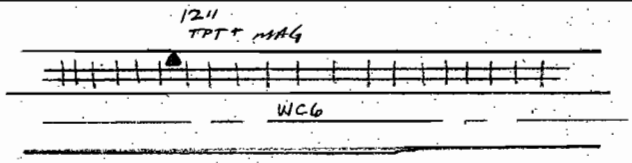
PROFILE VIEW



PLAN VIEW



T @ 1210 BS 1211 HD = 333.305
HI = 5.28 HT = 5.13
1212 5.13 CHK+1211 ⟨ERR. 0.016 / 0.006⟩
1213 5.80 ERM



1264 5.13 CHK+1211 ⟨ERR. 0.016 / 0.011⟩

6007

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME BR. WC 6

STREAM NAME: WALLER CREEK DATE: 09-28-07

LOCATION: 4TH ST. CREW MOSELEY REED EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1266

BRIDGE RAIL 4.0 DECK _____ WIDTH _____ PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

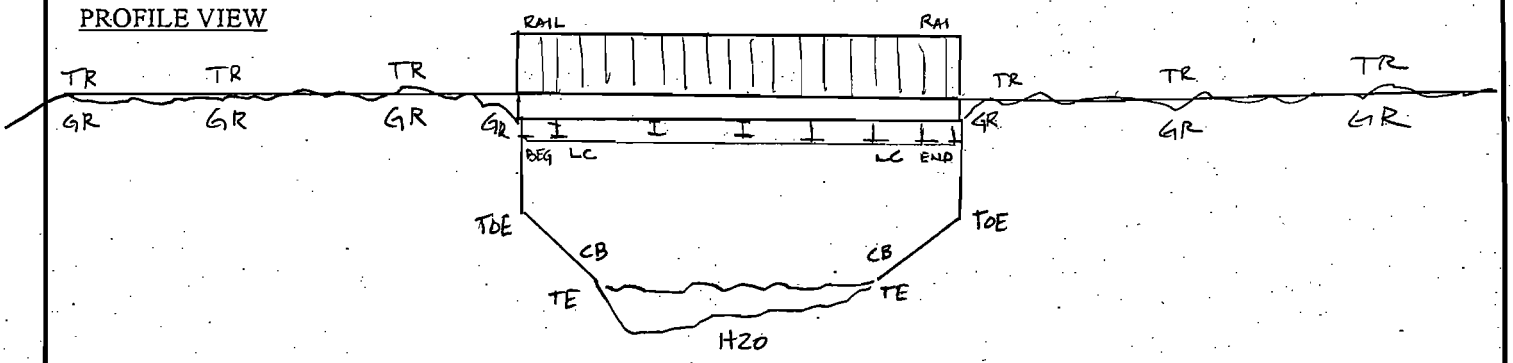
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

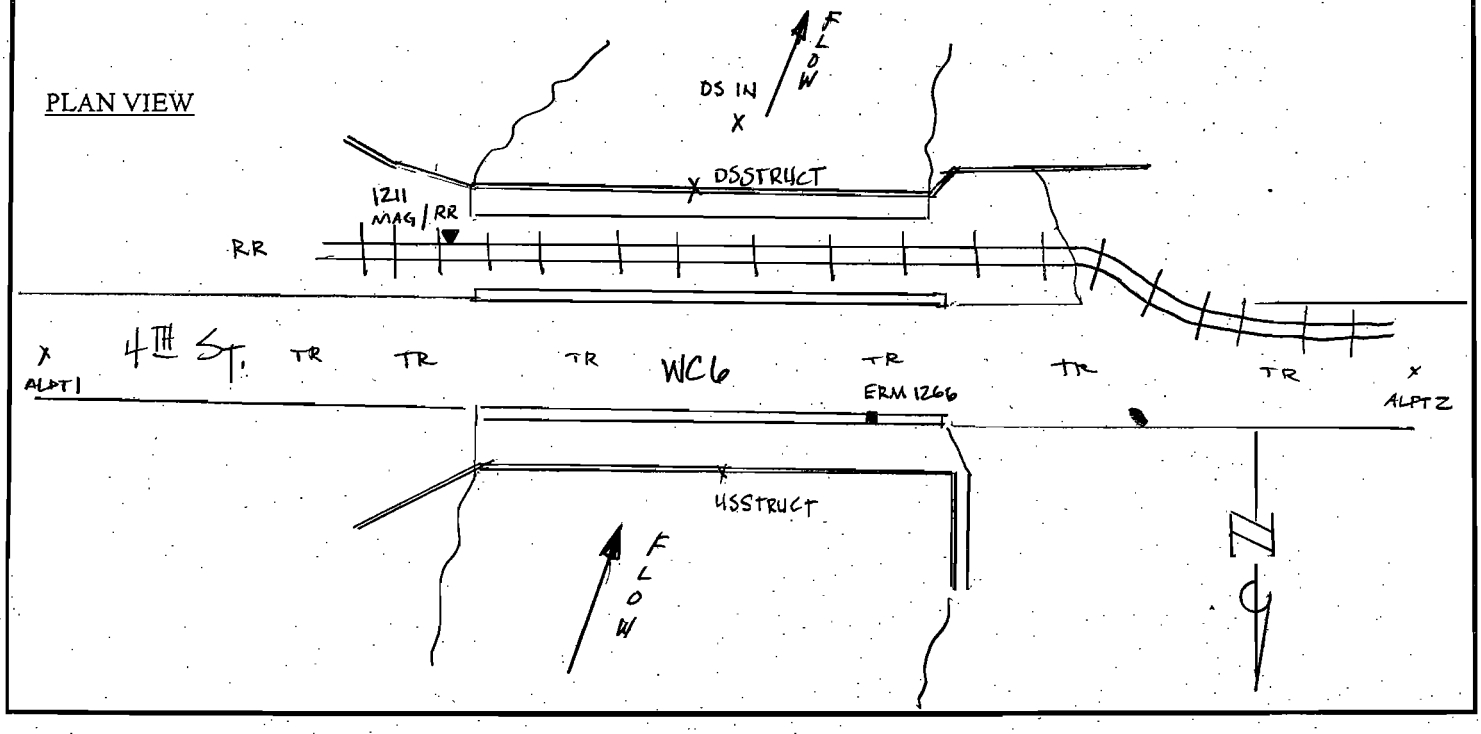
ERM DESCRIPTION: "Δ" FND ON US BK CRB +/- 3' EAST OF WEST END CRB # 1266

ADDL COMMENTS SHOTS 1265 - 1310

PROFILE VIEW



PLAN VIEW



T @ 1211 BS 1210

HI = 5.32 HT = 4.98

1265 4.98 CHK + 1210 ⟨ERR. 0.006 / 0.026⟩

1266 - 1309 X-SEC BR

1310 4.98 CHK + 1216 ⟨ERR. 0.006 / 0.003⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC-7

STREAM NAME: Waller Creek DATE: 09-28-07

LOCATION: 5th St. CREW Moseley Reed Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1314

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

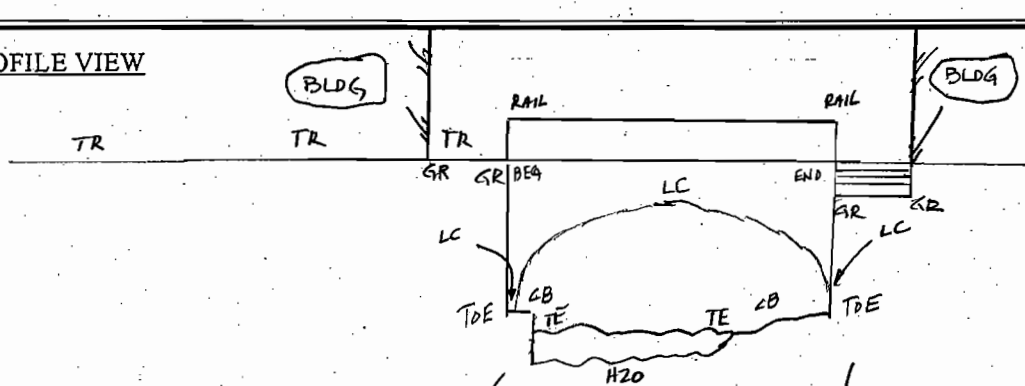
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

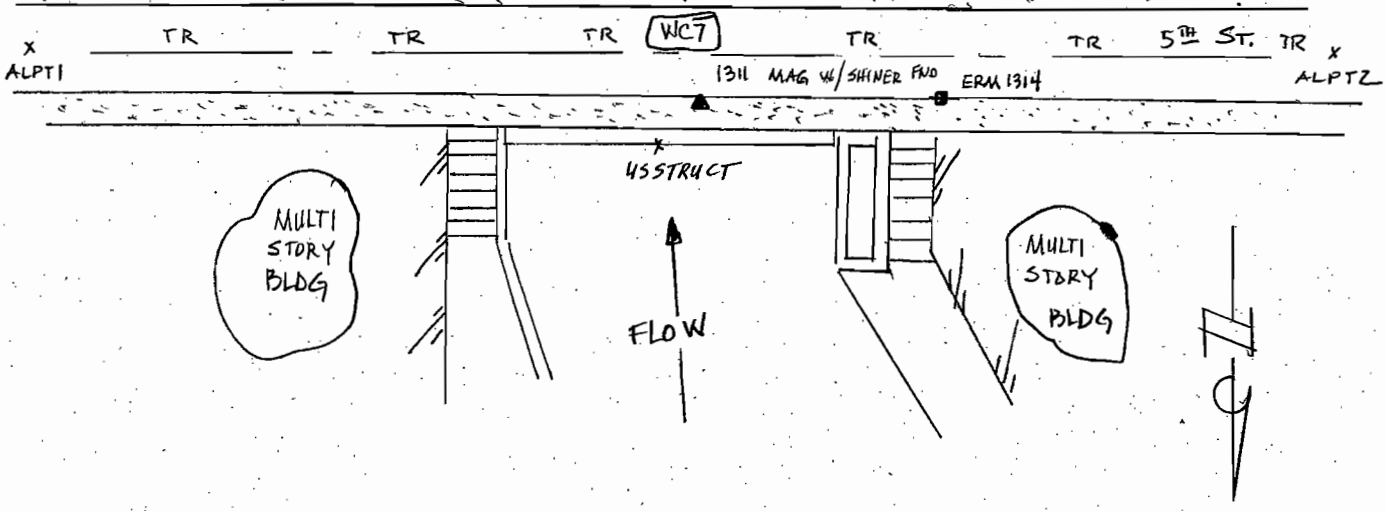
ERM DESCRIPTION: "□" cut on US Back Crb +/- 30' West of E Waller Creek #1314

ADDL COMMENTS Shots 1313 - 1362

PROFILE VIEW



PLAN VIEW



↑ @ 1311 BS 1312

HI = 4.87 HT = 5.20

1313 5.20 CHK + 1312 ⟨0.009 / 0.033⟩

1314

1362 CHK + 1312 ⟨0.036 / 0.026⟩

6TH ST.

1312 MAG SET

GOOD

PROJECT: _____ STRUCTURE NAME WC8

STREAM NAME: WALLER CREEK DATE: 09-28-07

LOCATION: 6TH ST. CREW Moseley REED EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1364

BRIDGE RAIL 4.4 DECK _____ WIDTH _____ PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

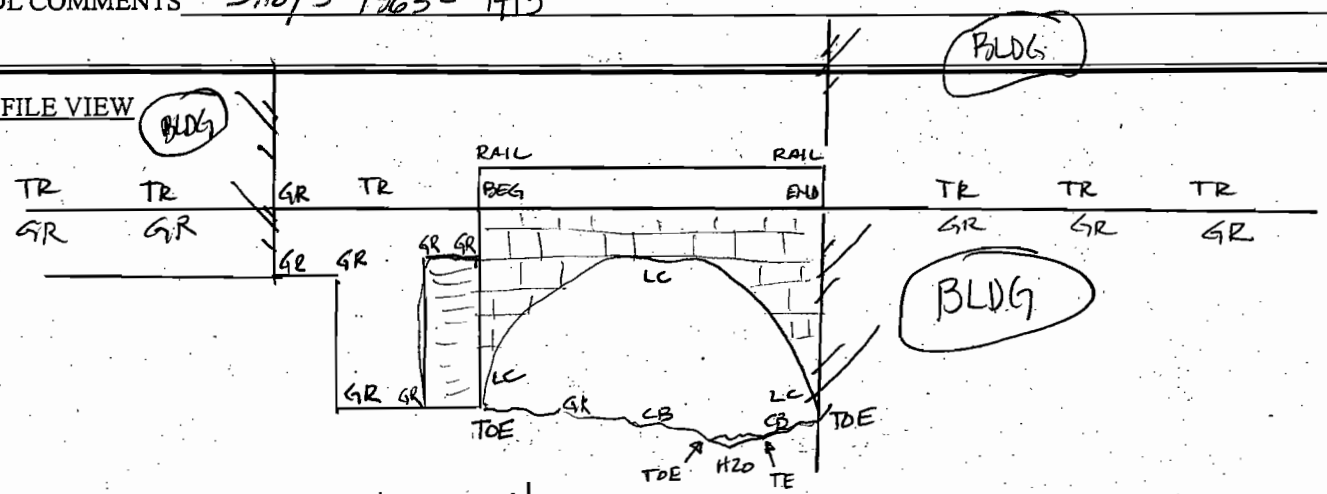
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

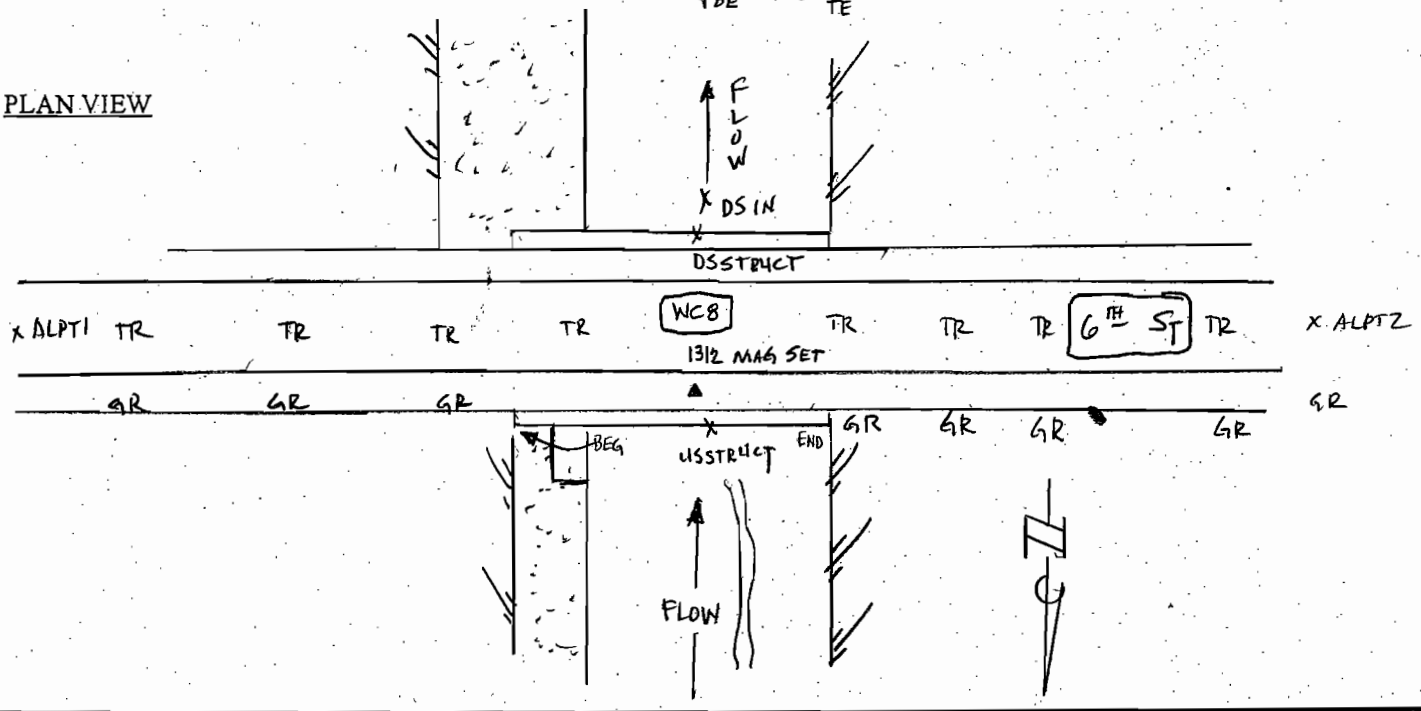
ERM DESCRIPTION: "□" CUT ON US BACK CRB @ WEST END BR

ADDL COMMENTS Shots 1363 - 1413

PROFILE VIEW



PLAN VIEW



↑ @ 1312 BS 1311

HI = 5.44 HT = 4.74

1363 4.74 CHK+1311 ⟨ERR. 0.005 / 0.018⟩

1413 4.74 CHK+1311 ⟨ERR. 0.005 / 0.042⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC9

STREAM NAME: WALLER CREEK DATE: 09-28-07

LOCATION: 7TH ST. CREW MOSELEY REED EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1417

BRIDGE RAIL 4.0 DECK _____ WIDTH _____ PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

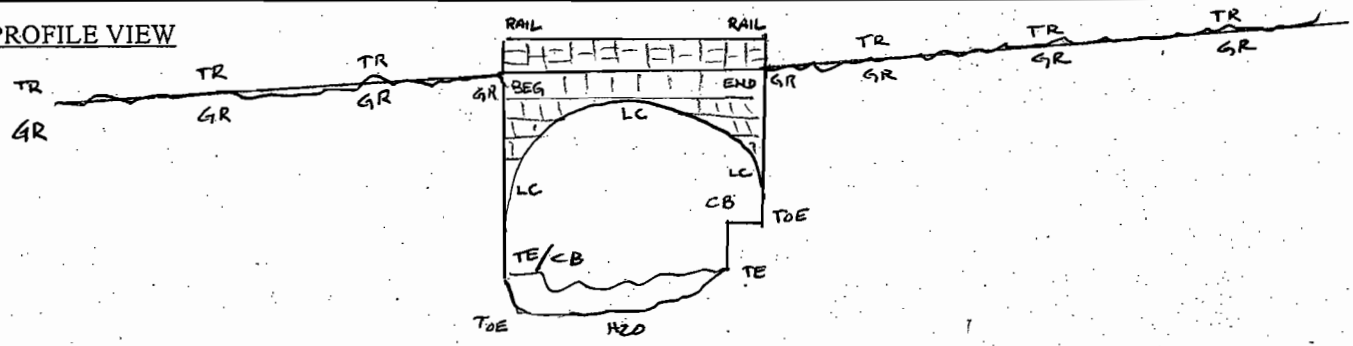
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "Δ" FND ON US BACK CRB @ ℄ WALLER CREEK BRIDGE # 1417

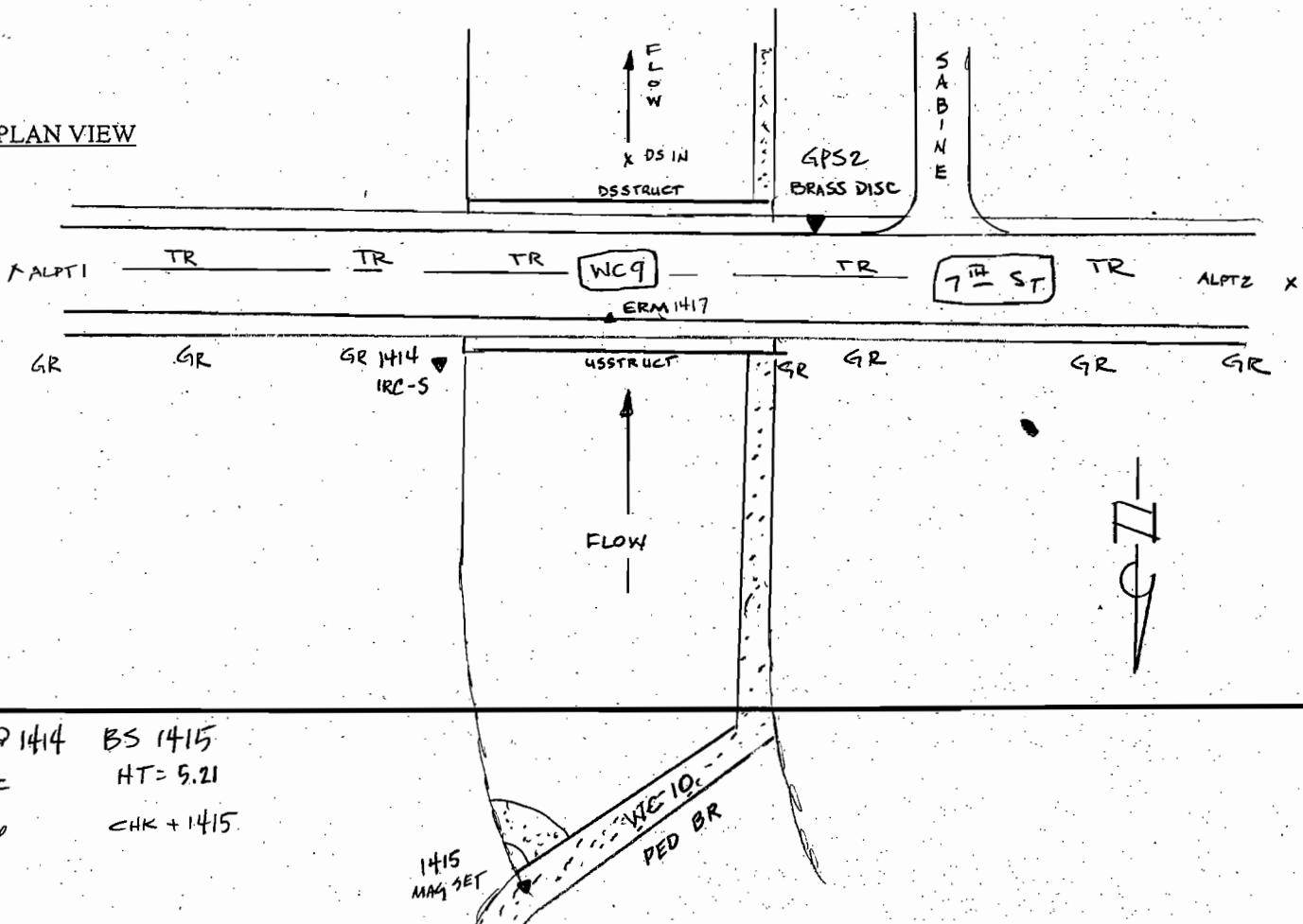
ADDL COMMENTS NOTE: POSSIBLE PED BR BETWEEN 6TH ST & 7TH ST.

SHOTS 1416 -

PROFILE VIEW



PLAN VIEW



TC @ 1414 BS 1415

HI = HT = 5.21

1416 CHK + 1415

6000

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC10

STREAM NAME: Waller Creek DATE: 10-01-07

LOCATION: Ped Br Between 7th & 8th CREW Moseley Combs Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1463

BRIDGE RAIL N/A DECK 0.5 WIDTH _____ PIER(s) 3 @ 0.7 PIER SHAPE sq

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

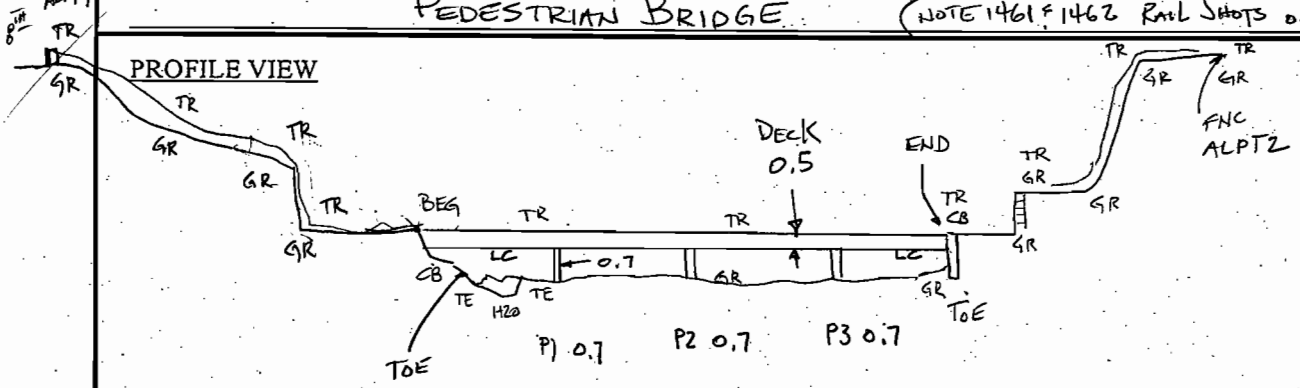
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" cut on US Right Top Bridge @ SW

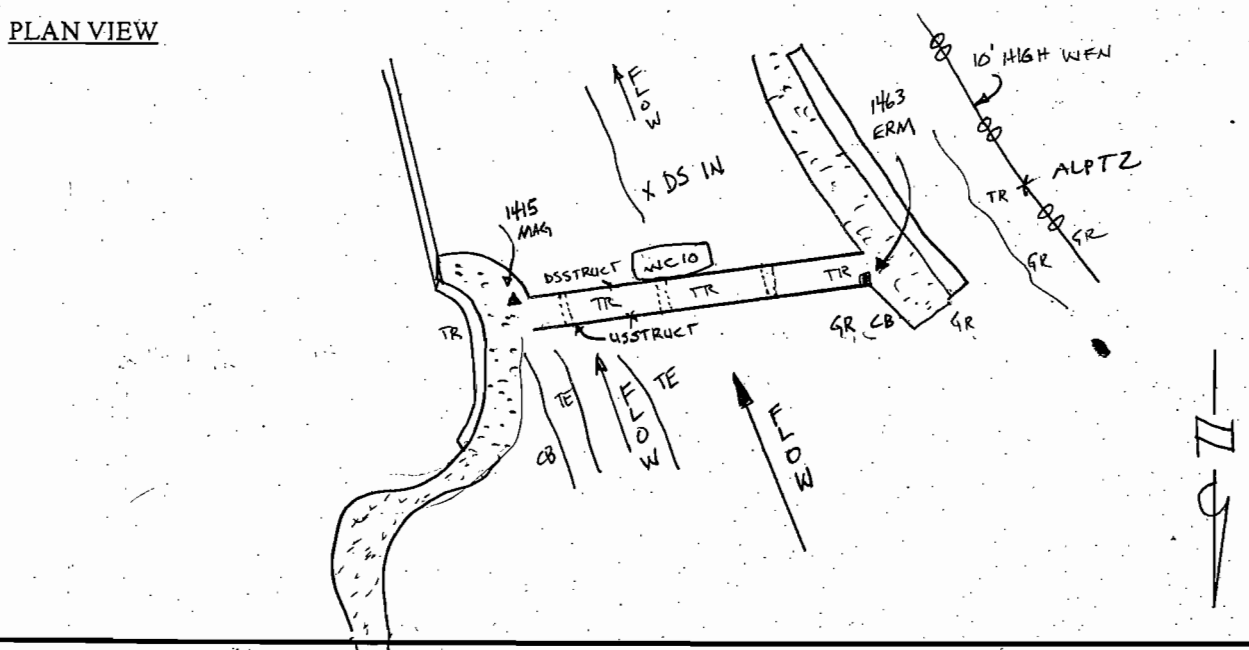
ADDL COMMENTS Shots 1463 - 1513 (No Rails)

Pedestrian Bridge (Note 1461 & 1462 Rail Shots on WC9 7th St.)

PROFILE VIEW



PLAN VIEW



T @ 1415 BS 1414

HI = 5.40 HT = 5.24

1460 5.24 CHK+ 1414 < 0.005 / 0.028 >

1513 5.24 CHK+ 1414 < 0.005 / 0.027 >

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 11

STREAM NAME: WALLER CREEK DATE: 10-01-07

LOCATION: 8TH ST CREW MOSELEY COMBS EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1517

BRIDGE RAIL _____ DECK VARIES WIDTH _____ PIER(s) 2 @ 3.0 PIER SHAPE RD.

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

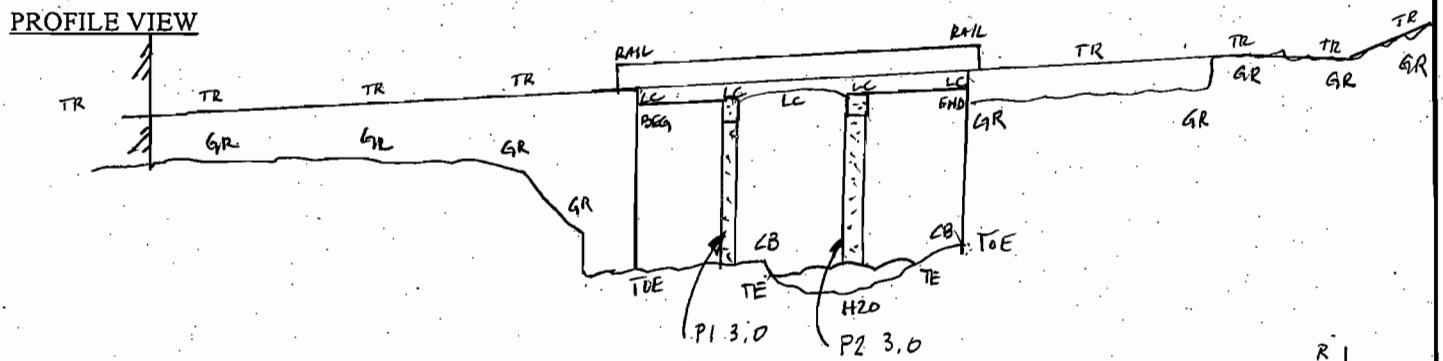
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" END CUT ON US BACK CRB @ ℄ WALLER CREEK # 1517

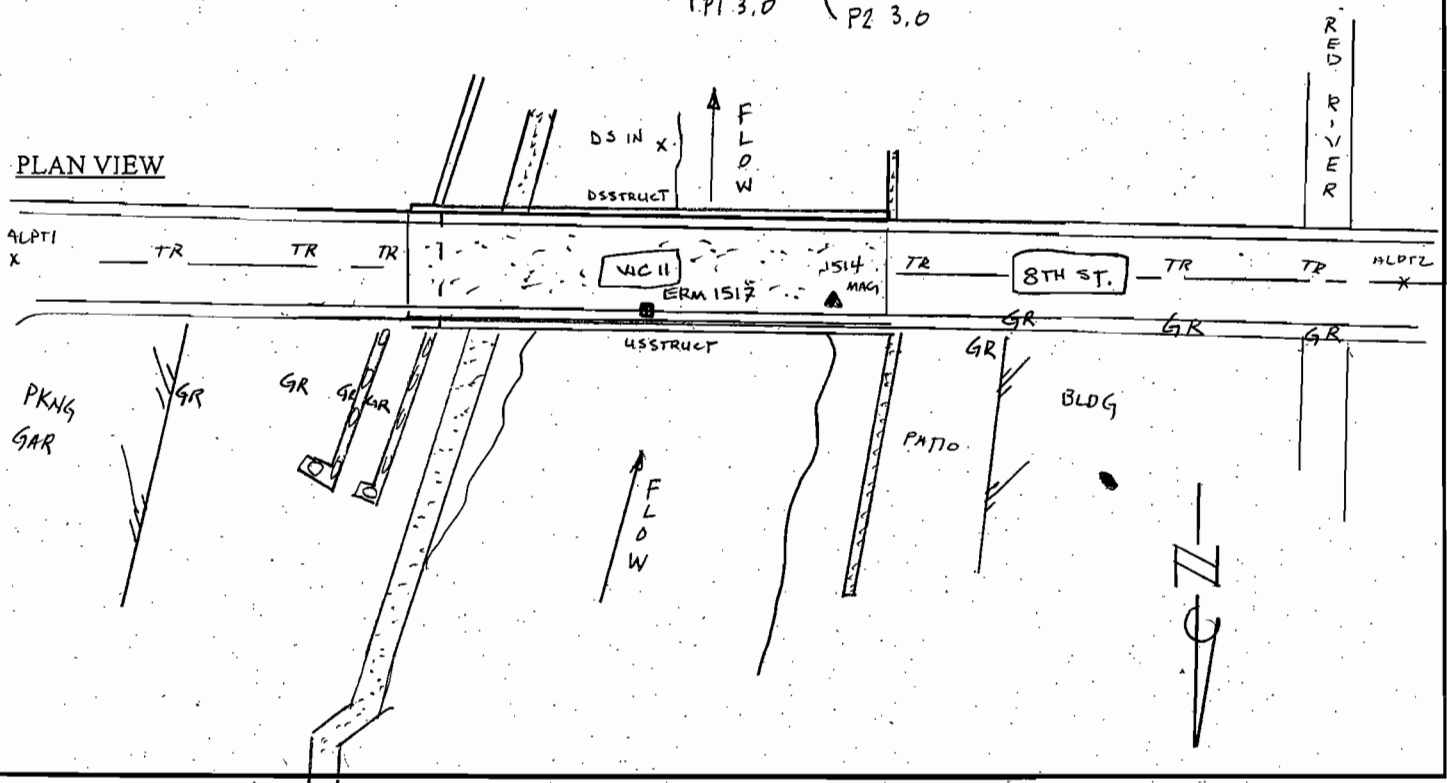
ADDL COMMENTS SHOTS 1516 – 1565

LEVEL LOOP ON BACK

PROFILE VIEW



PLAN VIEW



TC @ 1514 BS 1515

HI = 5.55 HT = 4.99

1516 4.99 CHK = 1515 < ERR. 0.006 0.026 >

1565 4.99 CHK = 1515 < ERR. 0.027 0.012 >

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC12

STREAM NAME: WALLER CREEK DATE: 10-01-07

LOCATION: 9TH ST. CREW MOSELEY COMBS EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1568

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 0 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

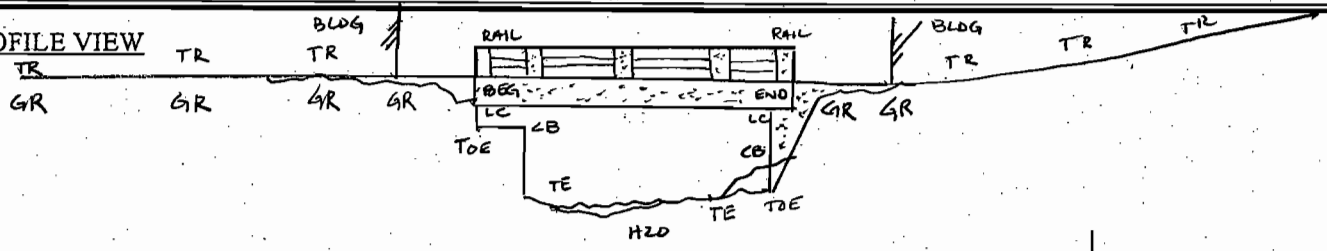
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "+" FND ON US SW @ ℄ WALLER CREEK

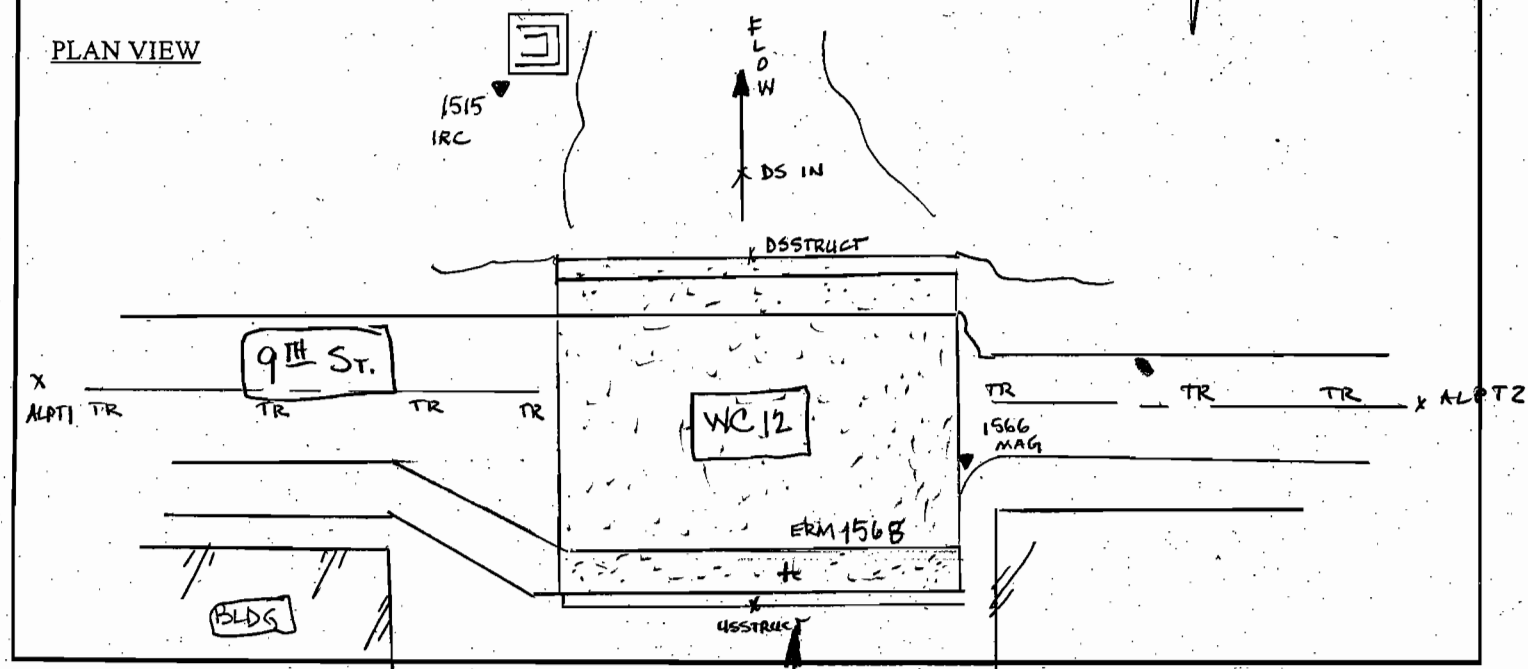
ADDL COMMENTS SHOTS 1567 – 1608

LEVEL LOOP ON BACK

PROFILE VIEW



PLAN VIEW



TC @ 1566 ; BS 1515

HI = 5.33 HT = 5.29

1567 5.28 CHK + 1515 ⟨0.007 / 0.031⟩

1568 ERM

1608 5.28 CHK + 1515 ⟨0.006 / 0.002⟩

FLOW

BLDG UNDER CONST

GOOD.

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC13

STREAM NAME: Waller Creek DATE: 10-01-07

LOCATION: 10TH St. CREW Moseley Combs Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1612

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

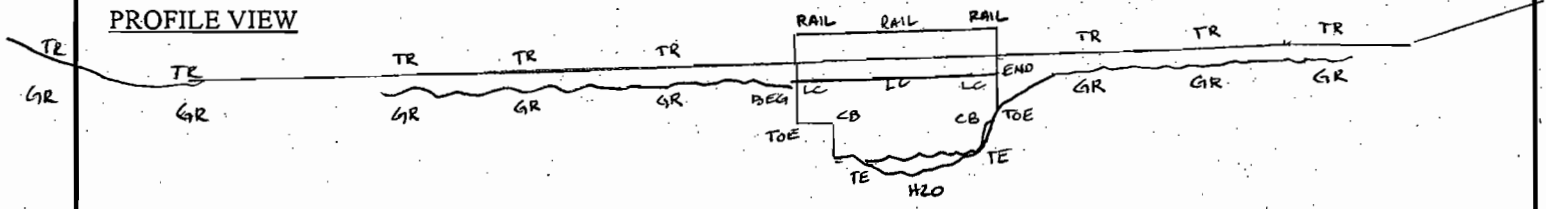
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" FND ON US CRB @ ℄ WALLER CREEK 1612

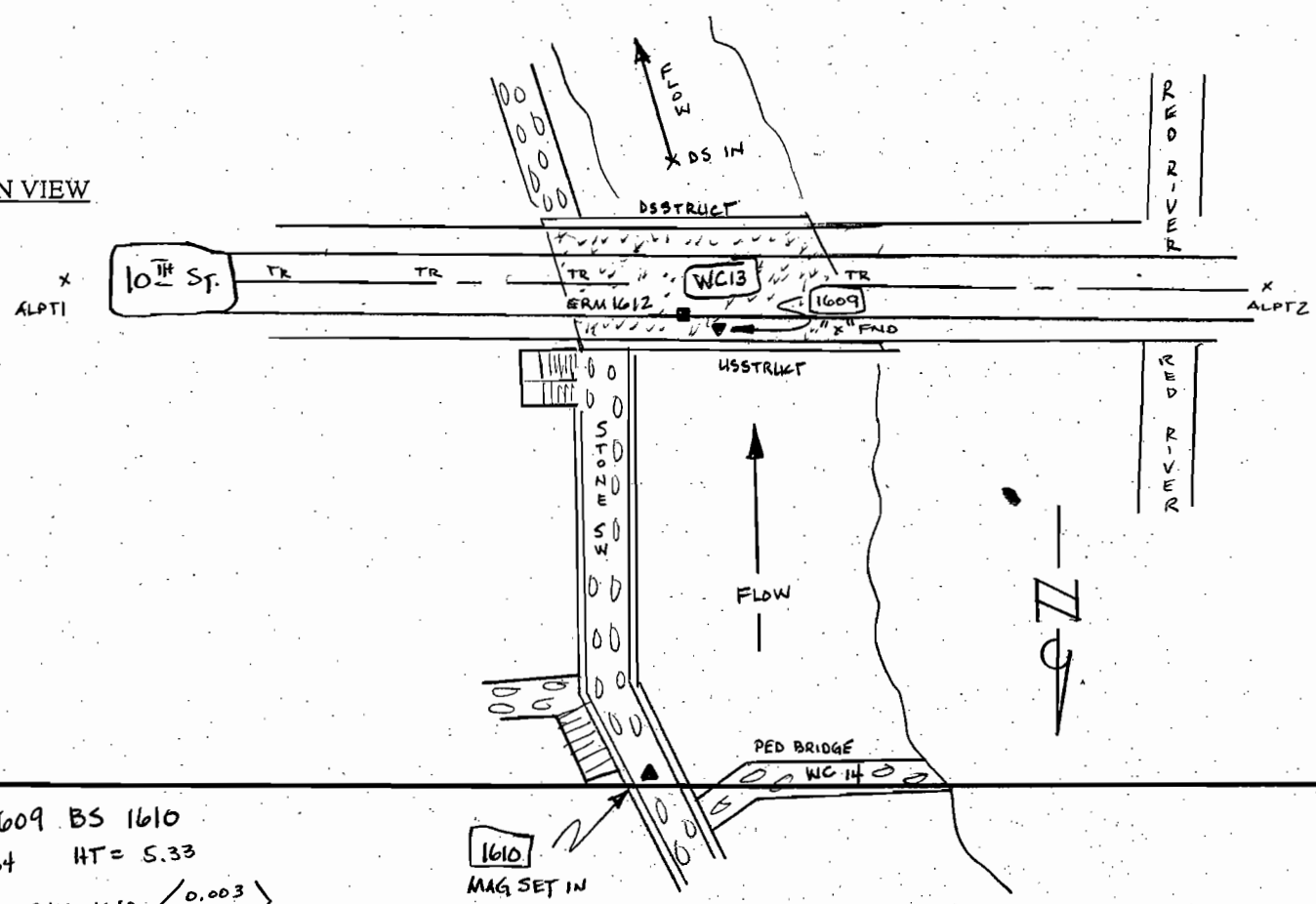
ADDL COMMENTS Shots 1611 - 1656

LEVEL LOOP ON BACK

PROFILE VIEW



PLAN VIEW



T @ 1609 BS 1610

HI = 5.34 HT = 5.33

1611 5.33 CHK+ 1610 < 0.003 0.007 >

1612 ERM

1656 5.33 CHK+ 1610 < 0.011 0.011 >

60017

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC14

STREAM NAME: WALLER CREEK DATE: 10-02-07

LOCATION: PED BRIDGE BETWEEN 10TH & 11TH ST. CREW MOSELEY COMBS EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1658

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) 3 @ VARIES PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

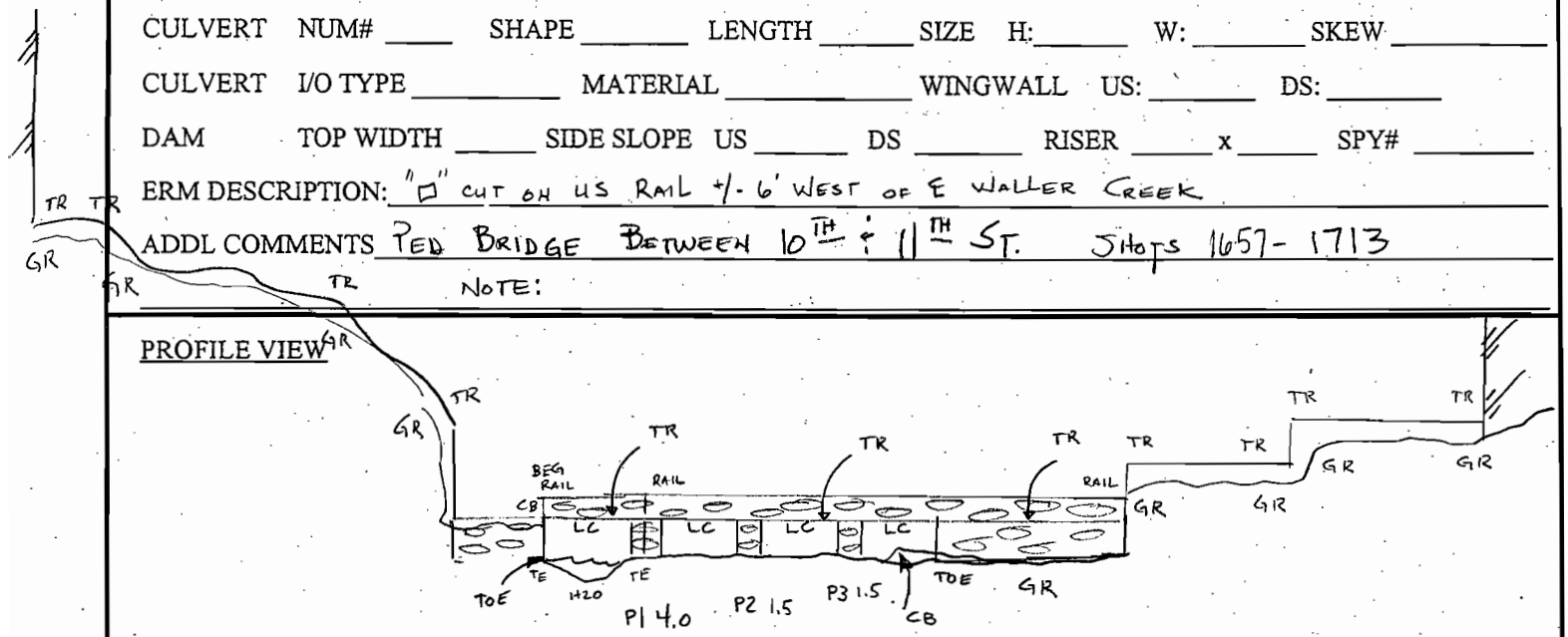
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US RAIL +/- 6' WEST OF E WALLER CREEK

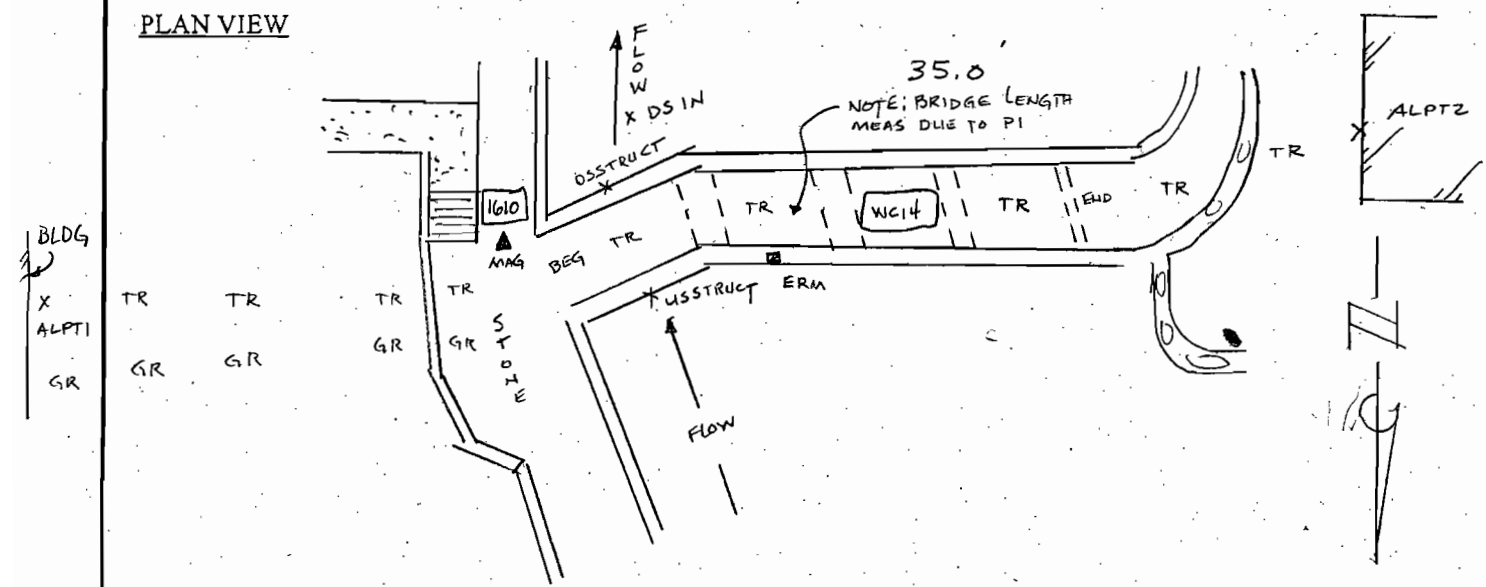
ADDL COMMENTS PED BRIDGE BETWEEN 10TH & 11TH ST. SHOTS 1657 - 1713

NOTE:

PROFILE VIEW



PLAN VIEW



T@1610 BS 1609

HI = 5.48 HT = 5.50

1657 5.50 CHK+ 1609 <ERR 0.005 0.02>

1658 5.80 ERM

1713 CHK+ 1609 0.025 0.023

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC15

STREAM NAME: Waller Creek DATE: 10-04-07

LOCATION: 11th St. CREW Moseley Granberry Thomason

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2020

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

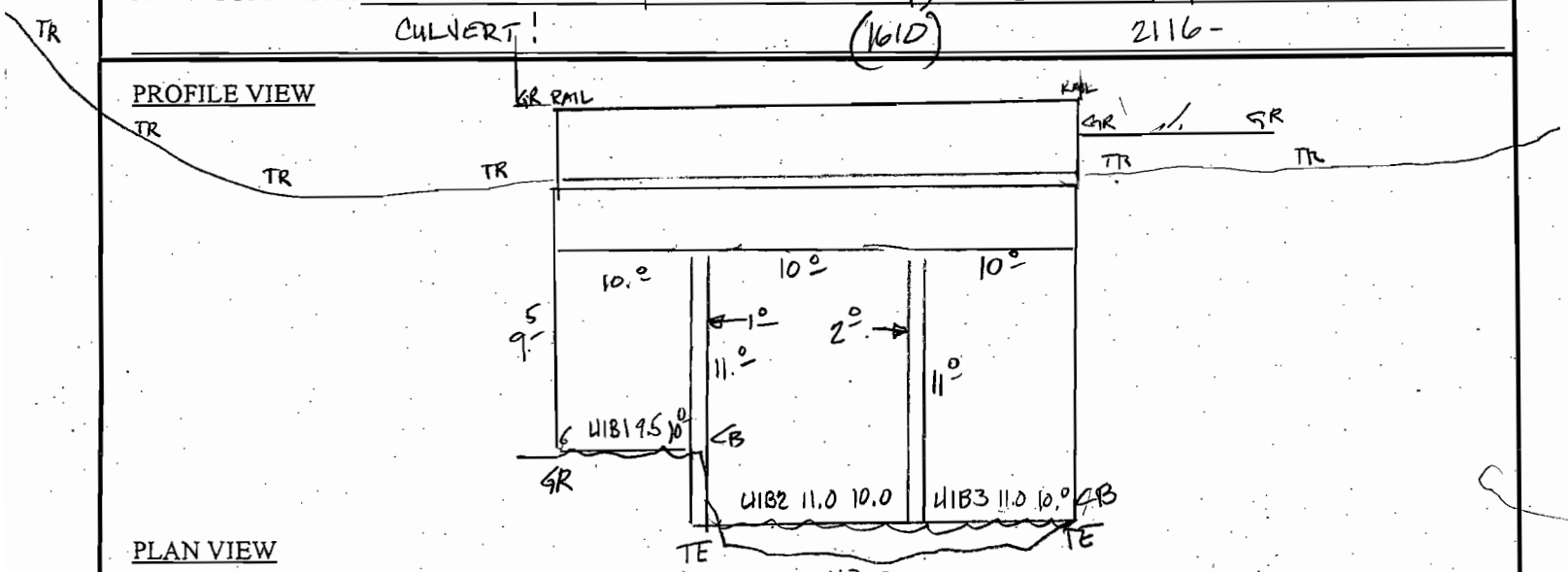
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

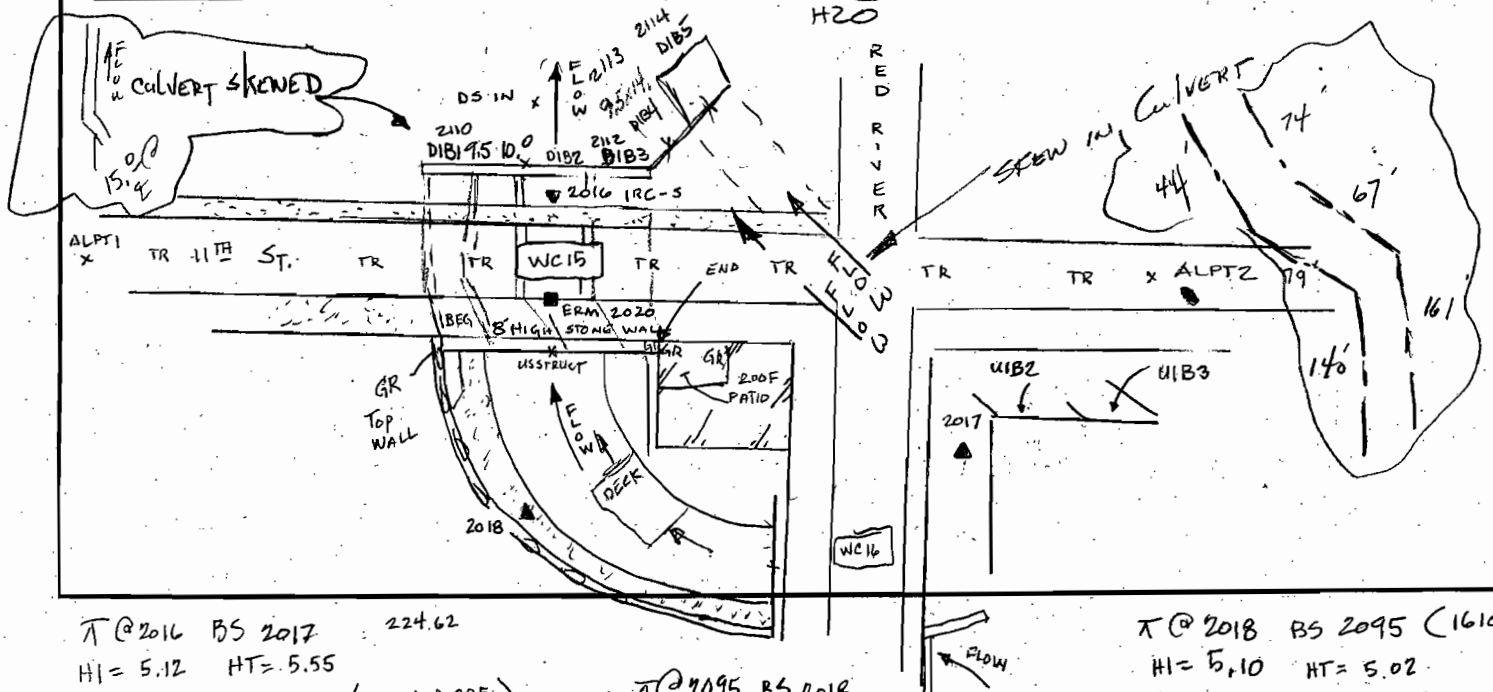
ERM DESCRIPTION: "□" cut on US Back Crb 11th St. = 2020

ADDL COMMENTS shots 2016 - 2046 & shots 2095 - 2108 2109 -
CULVERT! (1610) 2116 -

PROFILE VIEW



PLAN VIEW



T @ 2016 BS 2017 224.62
HI = 5.12 HT = 5.55
2019 5.55 CHK + 2017 ⟨ERR. 0.005 0.009⟩
2020 ERM
2046 5.55 CHK + 2017 ⟨ERR. 0.006 0.005⟩

T @ 2095 BS 2018
HI = 5.15 HT = 4.96
2109 4.96 CHK + 2018 ⟨ERR. 0.023 0.018⟩
2116 4.96 CHK + 2018 ⟨ERR. 0.027 0.022⟩

T @ 2018 BS 2095 (1610)
HI = 5.10 HT = 5.02
2096 5.02 CHK + ~~1610~~ 2095 0.083 0.041
2108 CHK + 2095

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 16

STREAM NAME: WALLER CREEK DATE: 10.04.07

LOCATION: RED RIVER CREW MOSELEY GRANBERRY THOMASON

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2048

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

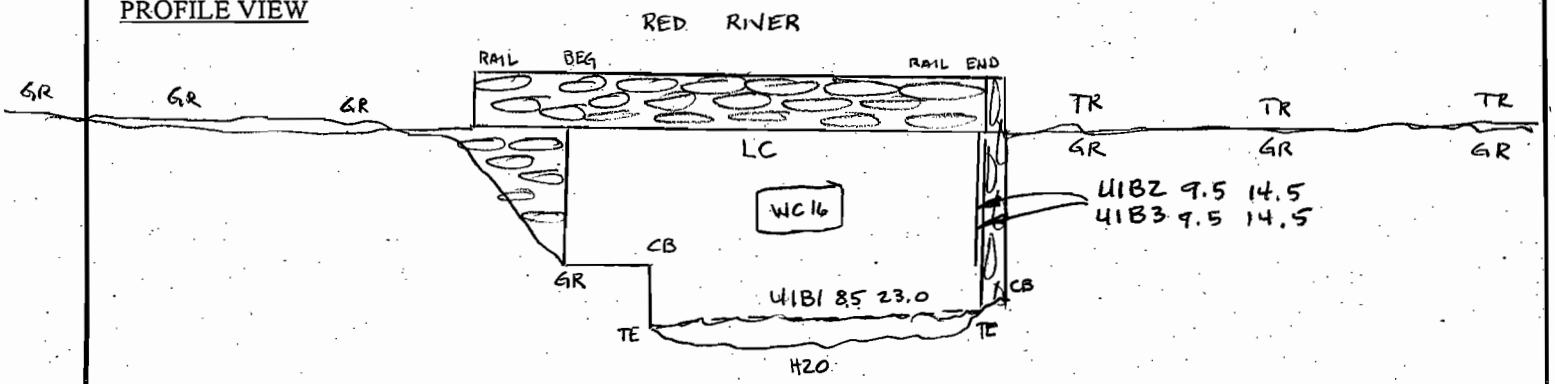
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

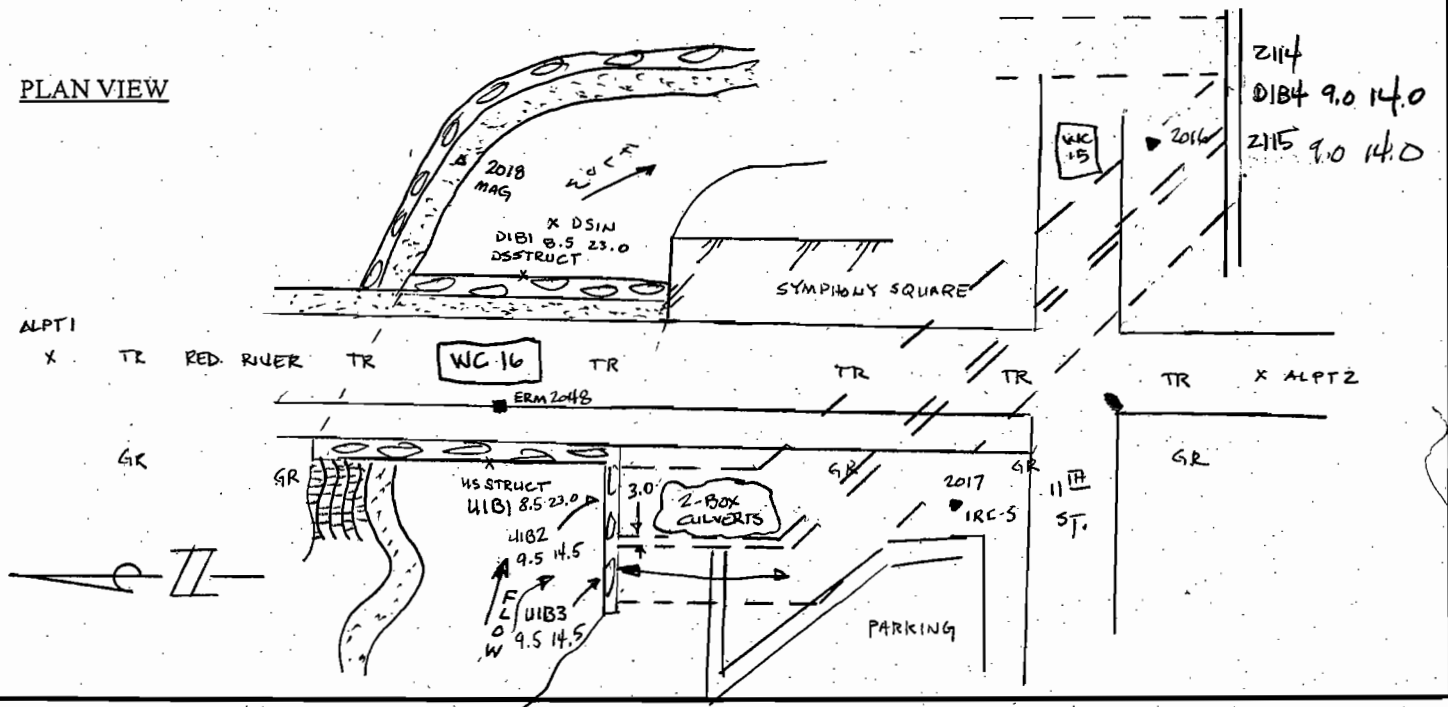
ERM DESCRIPTION: "D" END CUT ON US BACK CRB (W. SIDE RED RIVER) @ E WALLER CREEK # 2048

ADDL COMMENTS 2047 - 2094 ON WC16 (BOX CULVERT)

PROFILE VIEW



PLAN VIEW



T @ 2017 BS 2016

HI = 5.16 HT = 4.97

2047 4.97 CHK+ 2016 ⟨ERR. 0.022 / 0.010⟩

2048 ERM BR WC16

2094 4.97 CHK+ 2016 ⟨ERR. 0.022 / 0.031⟩

9.5 x 14.5

23.85

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC17

STREAM NAME: Waller Creek DATE: 12-18-07

LOCATION: Red River & 11th CREW Moseley Combs Thomason

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4716

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 2 SHAPE Box LENGTH _____ SIZE H: 9.0 W: 13.0 SKEW YES

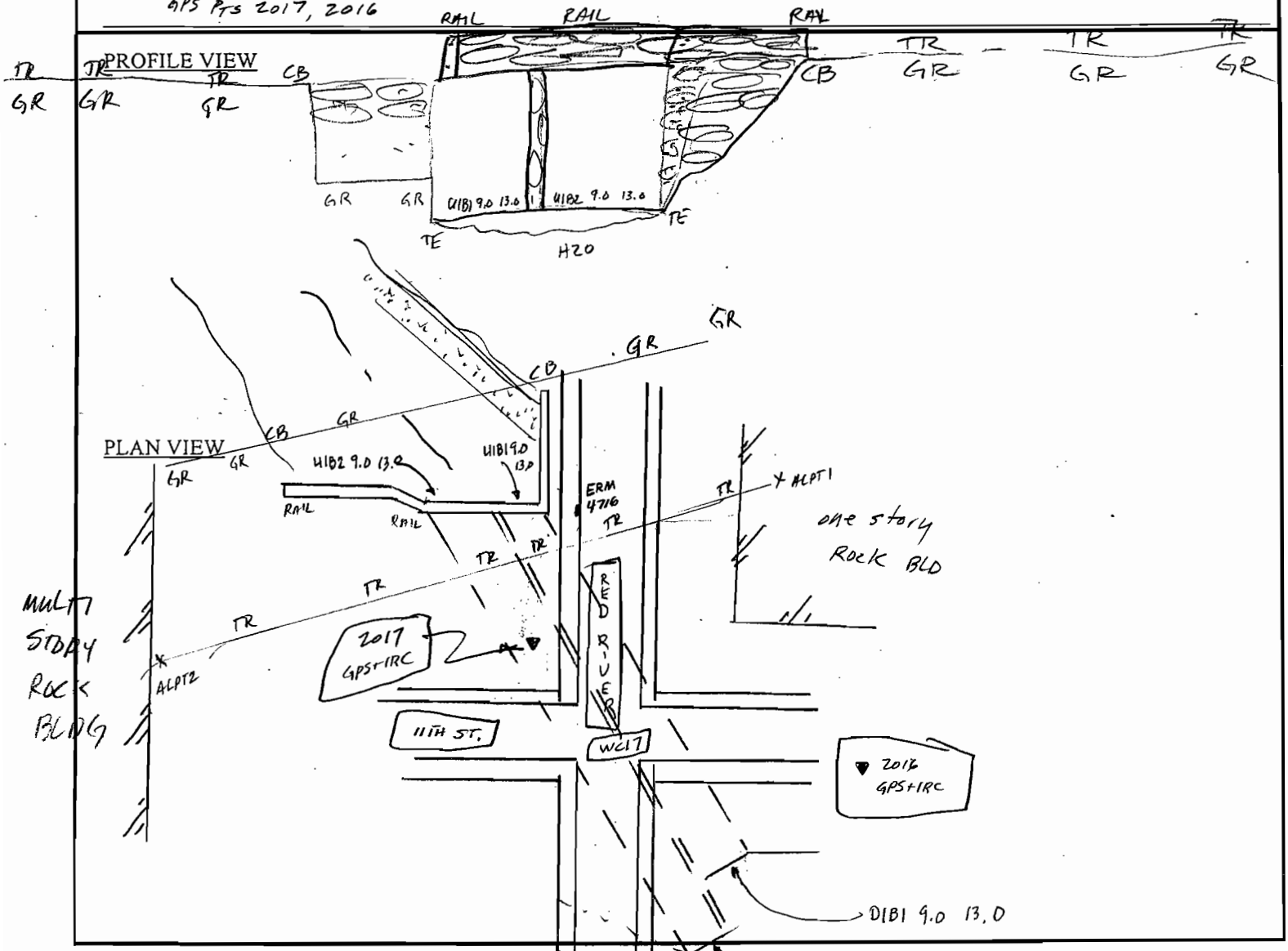
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" cut on Top Curb W. Side Red River @ End WC16

ADDL COMMENTS Shots 4715 – 4754 Note Culvert Bends

GPS Pts 2017, 2016



TC @ 2017 BS 2016

HI = 5.34 HT = 5.41

4715 5.41 CHK + 2016 <ERR 0.02 0.01>

4754 5.41 CHK + 2016 <ERR 0.02 0.00>

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 18

STREAM NAME: WALLER CREEK DATE: 10-02-07

LOCATION: PED BRIDGE US of RED RIVER @ SE COR WATERLOO PARK CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1717

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

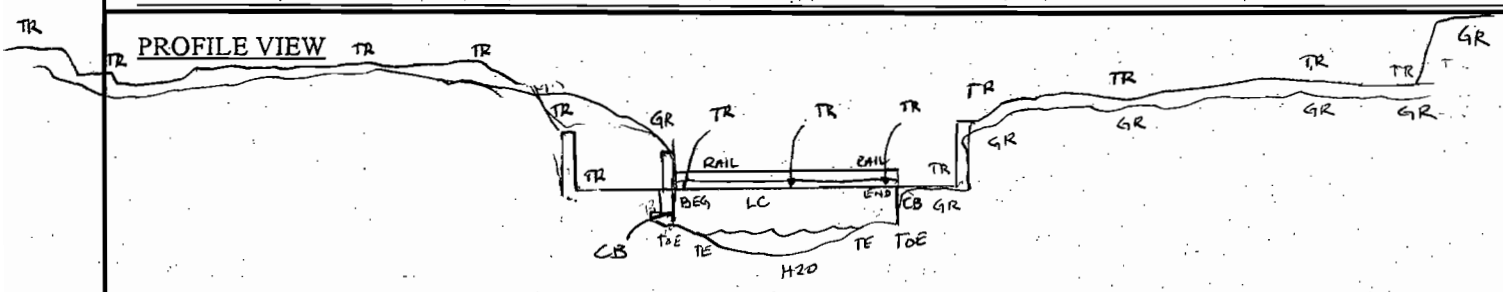
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

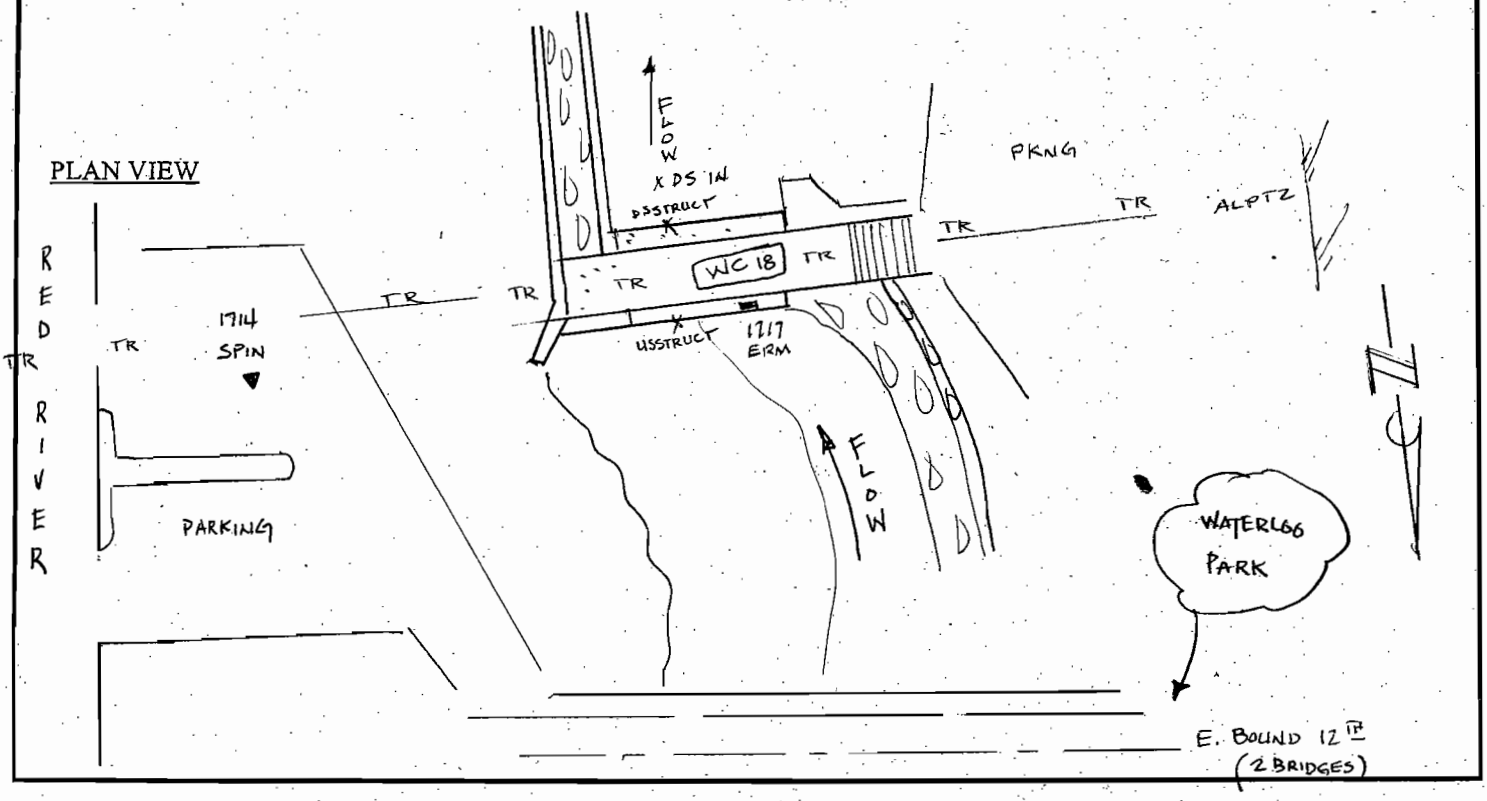
ERM DESCRIPTION: "□" CUT ON US RIGHT RAIL

ADDL COMMENTS SHOTS 1716 - 1767 PED BRIDGE

PROFILE VIEW



PLAN VIEW



T @ 1714 BS 1715
HI = 5.58 HT = 5.79
1716 CHK + 1715 ⟨ERR 0.018 / 0.026⟩
1717 ERM
1767 5.79 CHK + 1715 ⟨ERR 0.007 / 0.007⟩

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC-19

STREAM NAME: Waller Creek DATE: 10-02-07

LOCATION: 12TH St. CREW Moseley Combs Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1769

BRIDGE RAIL 4½ DECK _____ WIDTH _____ PIER(s) 1 @ 3.0 PIER SHAPE Sq

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

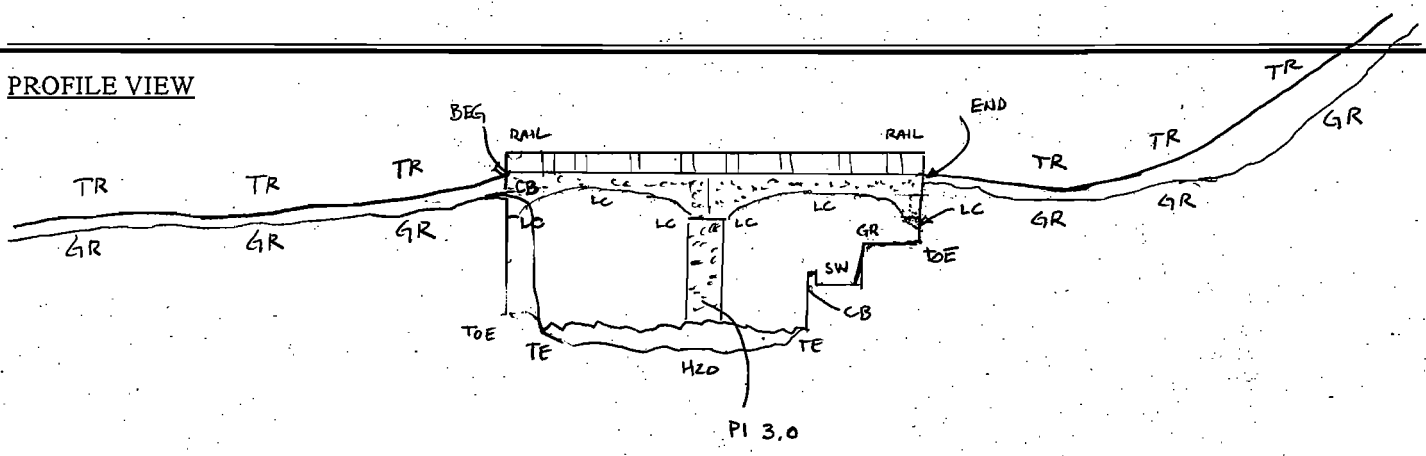
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

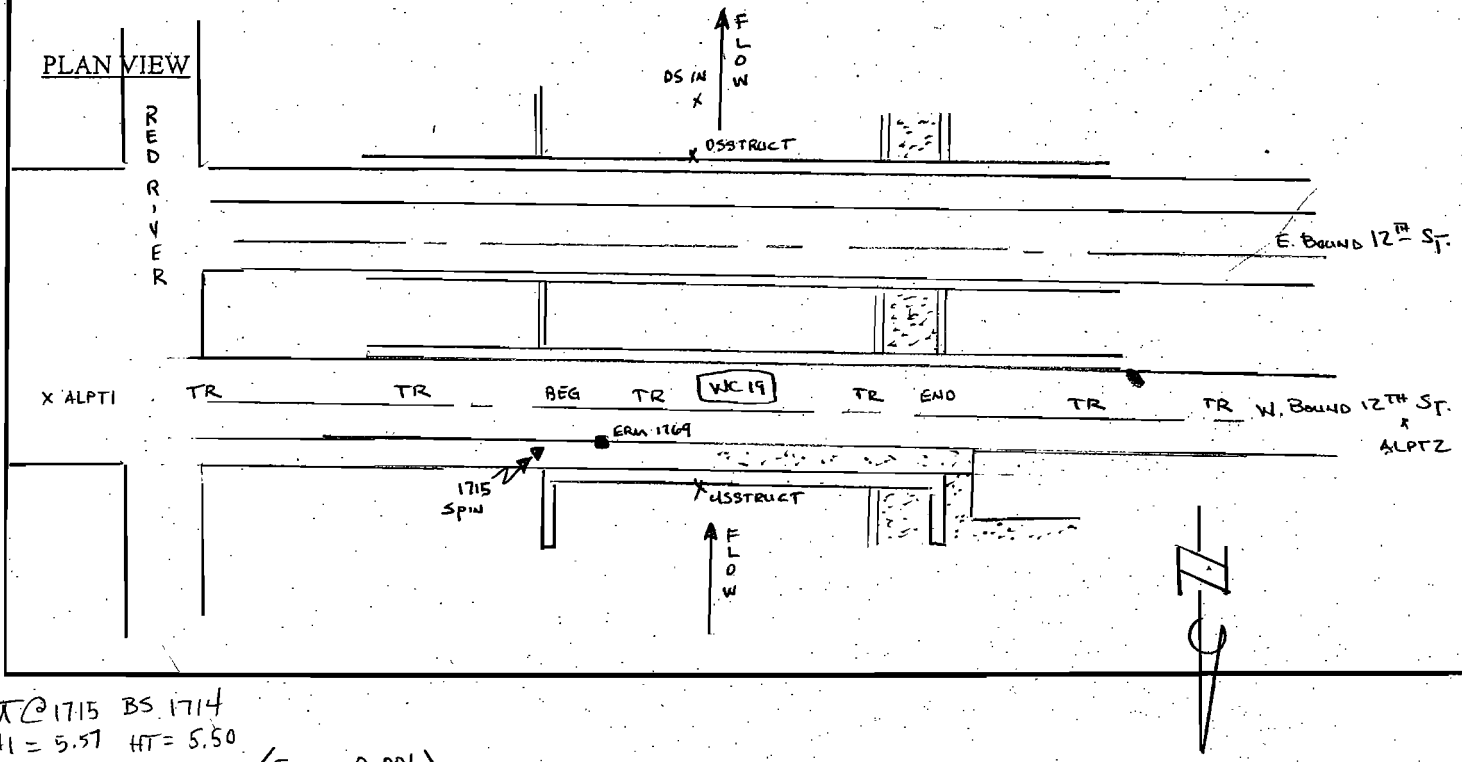
ERM DESCRIPTION: "□" Cut on US Left Crb +/- 6' W of E End BR

ADDL COMMENTS Double Bx. Shot as One Shots 1768 - 1817

PROFILE VIEW



PLAN VIEW



TC@1715 BS 1714
HI = 5.57 HT = 5.50
1768 CHK+1714 ⟨ERR. 0.001 0.061⟩
1769 ERM
1817 CHK+1714 ⟨ERR. 0.017 0.045⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 20

STREAM NAME: Waller Creek DATE: 10-02-07

LOCATION: 1ST Ped Br US of 12TH St. CREW Moseley Combs Thomason

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1821

BRIDGE RAIL 1.0 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

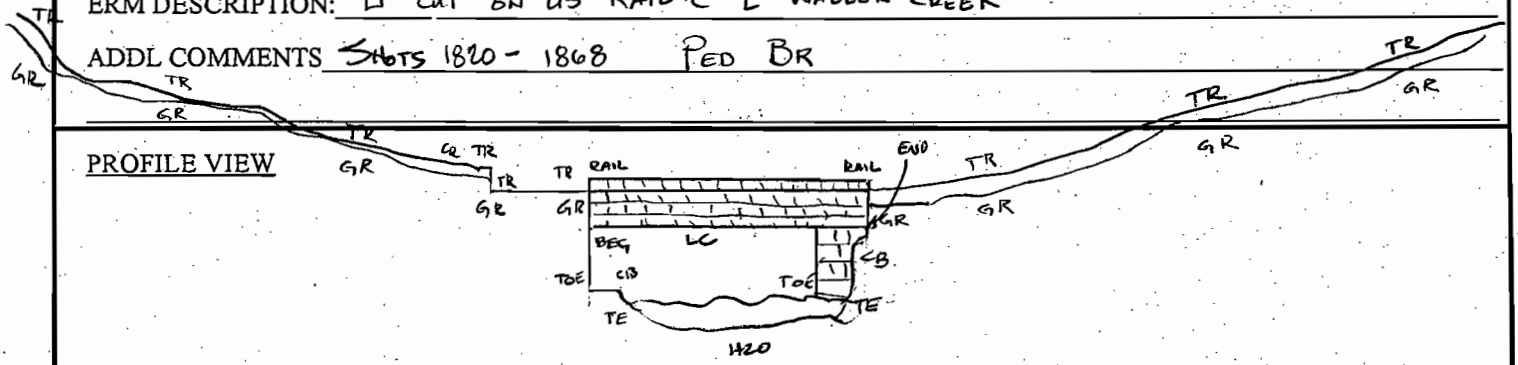
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

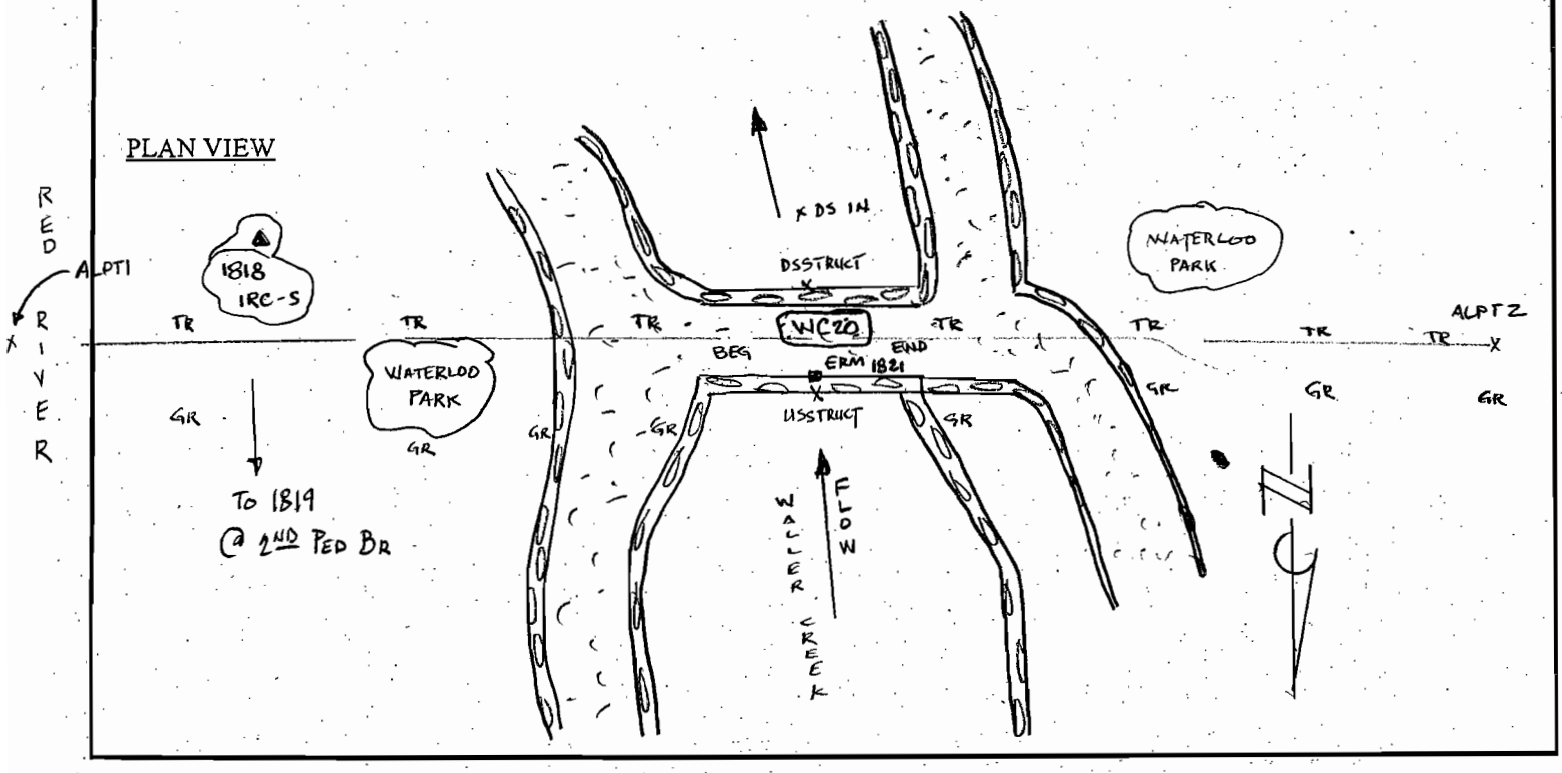
ERM DESCRIPTION: "□" CUT ON US RAIL @ ℄ WALLER CREEK

ADDL COMMENTS Shots 1820 - 1868 Ped Br

PROFILE VIEW



PLAN VIEW



T @ 1818 BS 1819

HI = 5.42 HT = 5.40

1820 CHK + 1819 ⟨ERR 0.013 / 0.017⟩

1821 ERM

1868 CHK + 1819 ⟨ERR 0.013 / 0.059⟩

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC-21

STREAM NAME: Waller Creek DATE: 10-03-07

LOCATION: 2ND Ped Br US of 12th St (Waterloo Pk) CREW Moseley Combs Thomason

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1870

BRIDGE RAIL 0.5 DECK _____ WIDTH _____ PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

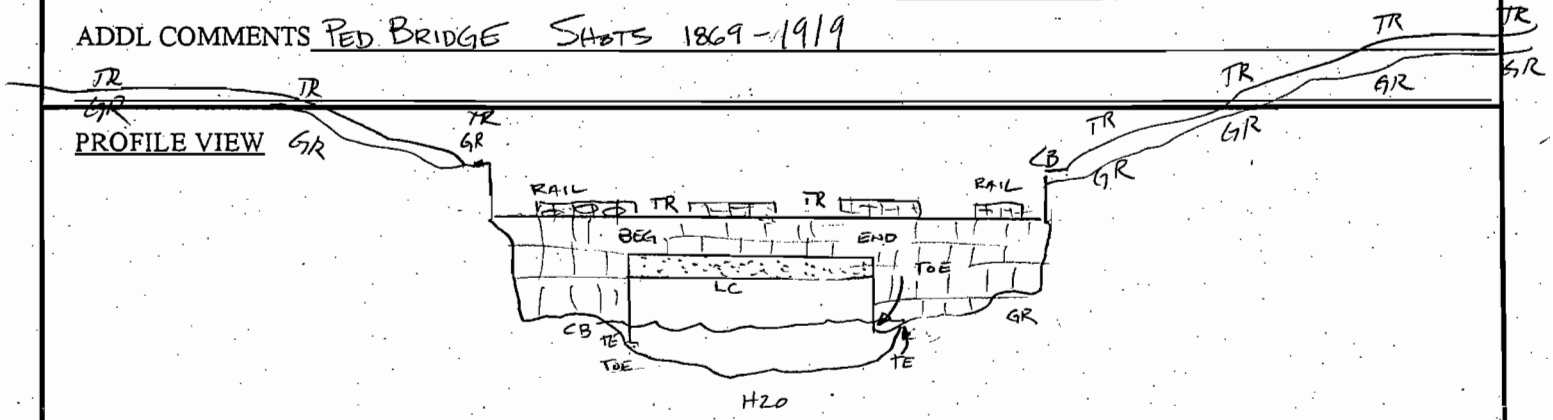
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

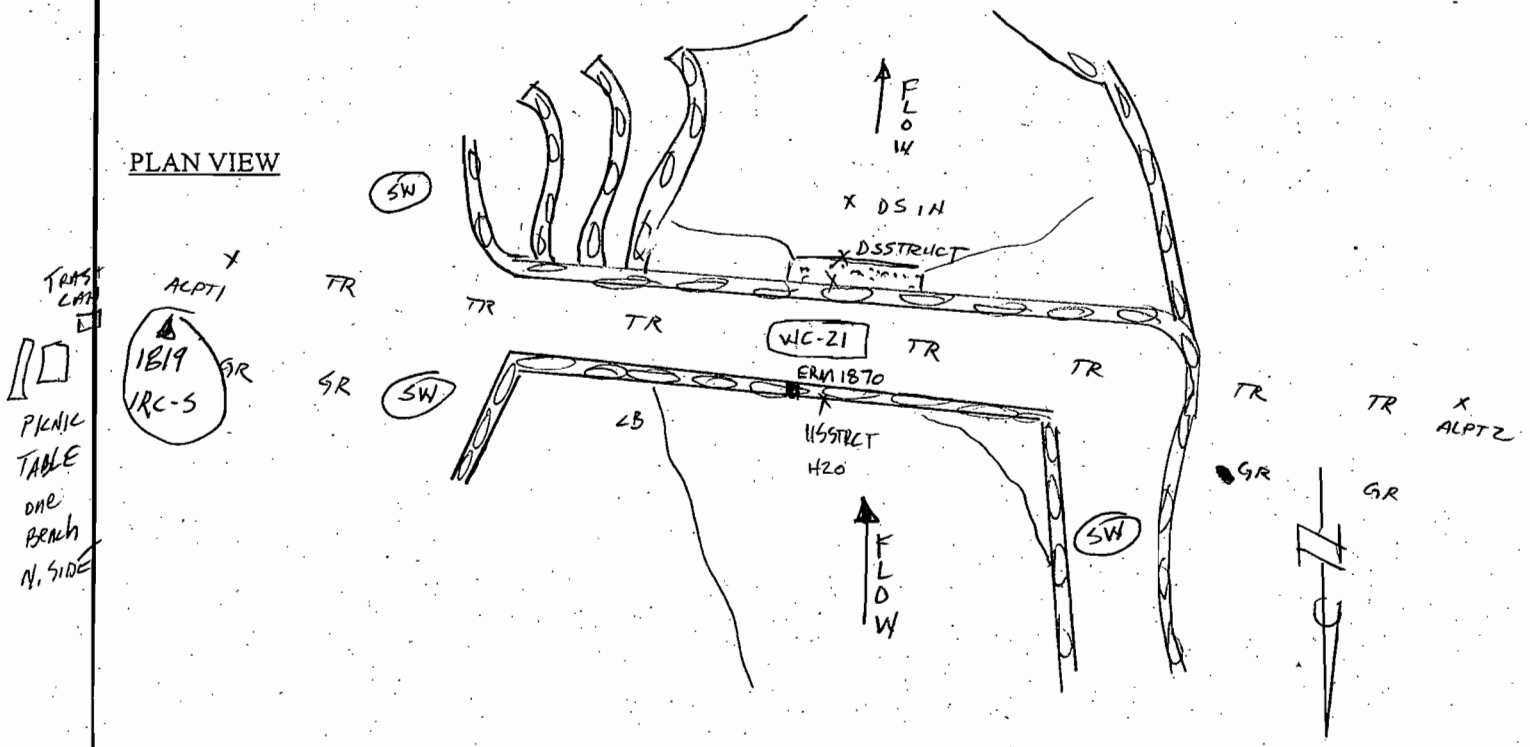
ERM DESCRIPTION: "D" cut on US Rail @ ℄ Waller Creek

ADDL COMMENTS Ped Bridge Shots 1869 - 1919

PROFILE VIEW



PLAN VIEW



T @ 1819 ; BS 1818

HI = 5.55 HT = 5.47

1869 CHK + 1818 ⟨ ERR 0.014 / 0.005 ⟩

1919 CHK + 1818 ⟨ ERR: 0.014 / 0.005 ⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC22

STREAM NAME: WALLER CREEK DATE: 10-03-07

LOCATION: 3RD PED BR. US OF 12TH WATERLOO PARK CREW MOSELEY COMBS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1972

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

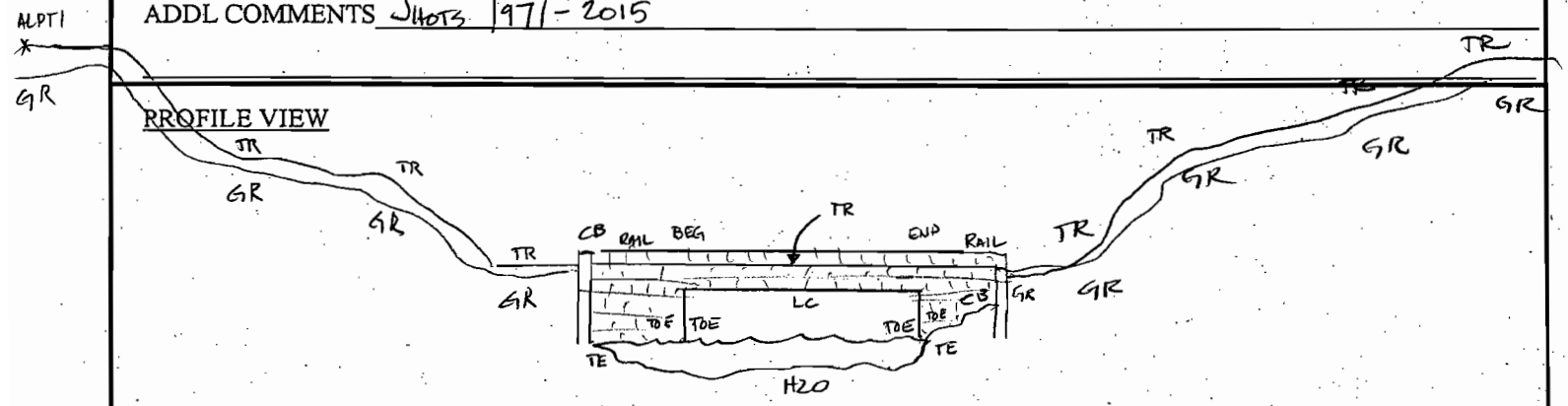
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

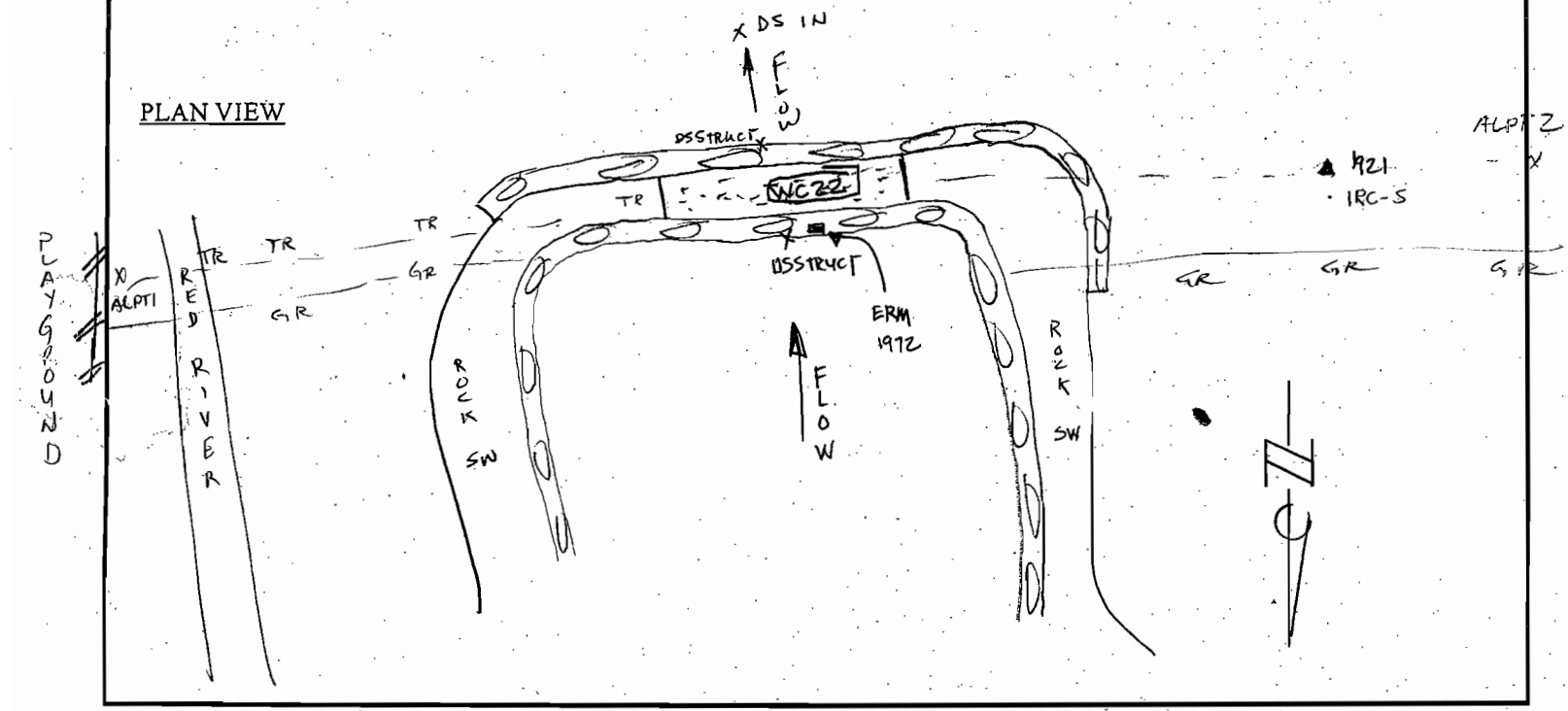
ERM DESCRIPTION: "A" CUT ON US RAIL @ ℄ WALLER CREEK ± 1972

ADDL COMMENTS SHOTS 1971 - 2015

PROFILE VIEW



PLAN VIEW



T@1921 BS 3
HI=5.37 HT=5.31
1971 - 5.31 CHK+3 ⟨ERR. 0.02 / 0.01⟩
1972 S.B ERM
2015 5.31 CHK+3 ⟨ERR. 0.025 / 0.007⟩

4
GPS 3
MON +

COOP

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC23

STREAM NAME: WALLER CREEK DATE: 10-03-07

LOCATION: PED BRIDGE (OLD ST. BR.) 1ST BR DS OF 15TH 4TH CREW MOSELEY

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 1923

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

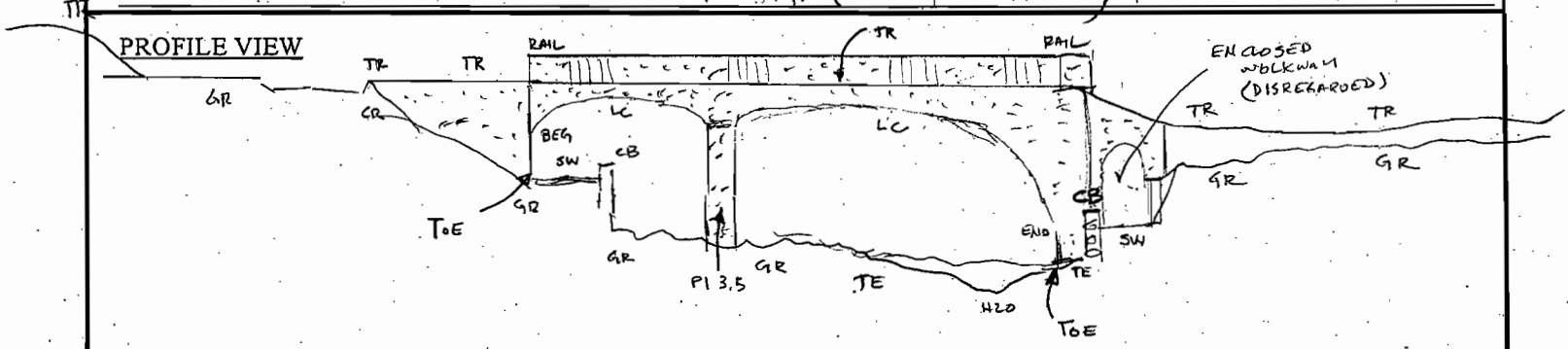
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US SW @ E WALLER CREEK # 1923

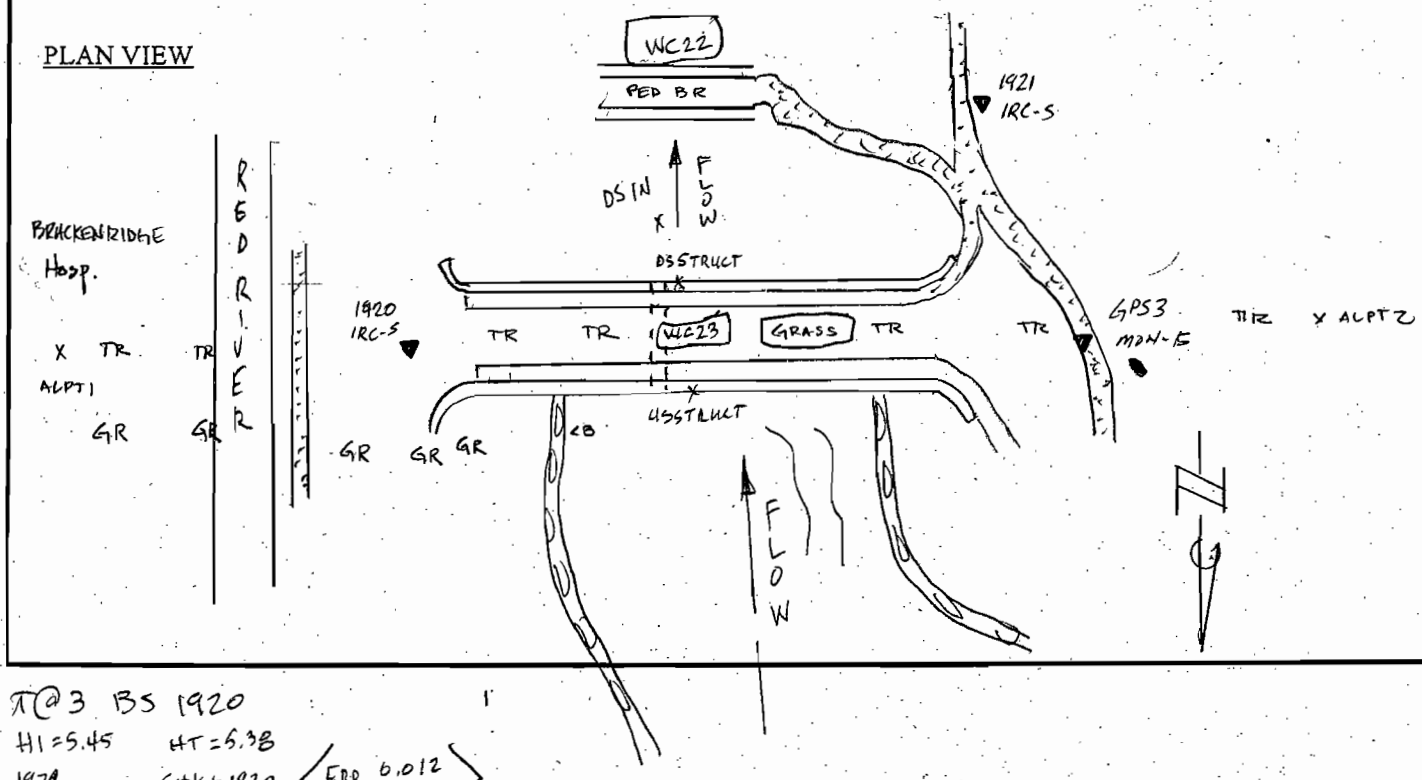
ADDL COMMENTS SHOTS 1922 - 1970

4TH PED BR. US OF 12TH ST. (OLD ST. BR. (wide)) 1ST PED BR DS OF 15TH

PROFILE VIEW



PLAN VIEW



T@3 BS 1920

HI = 5.45 HT = 5.38

1922 CHK + 1920 ⟨ERR 0.012 0.019⟩

1921 5.11 TPT + IRC-S

1970 CHK ⟨ERR. 0.008 0.014⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC24 SHT 1 OF 2

STREAM NAME: WALLER CREEK DATE: 10-05-07

LOCATION: 15TH ST. CREW MOSELEY REED THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2120

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

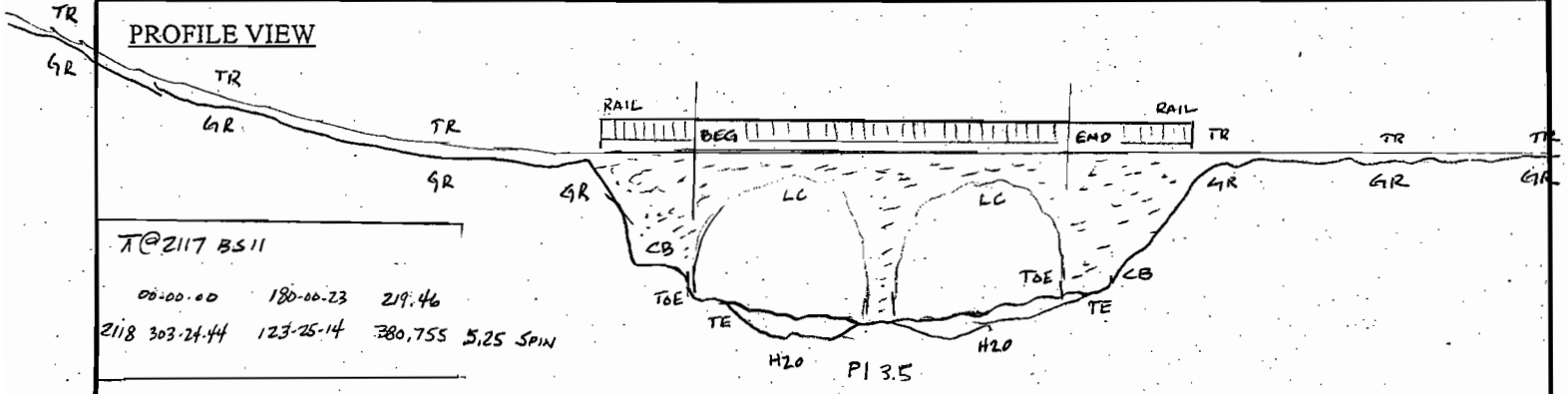
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US BACK CRB @ E WALLER CREEK # 2120

ADDL COMMENTS SHOTS 2117 - 2164

PTS TO GPS 11-2117-2118

PROFILE VIEW

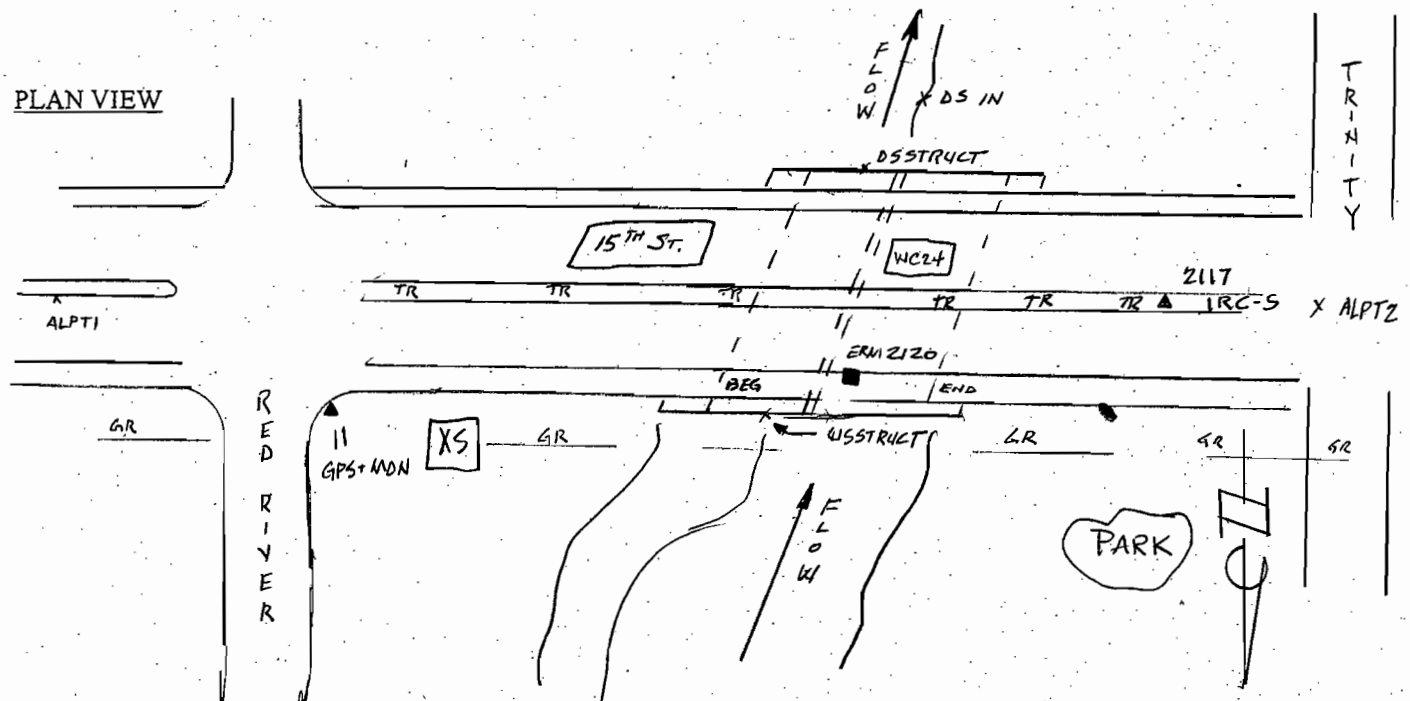


T@2117 BS 11

00-00-00 180-00-23 219.46

2118 303-24-44 123-25-14 380,755 5.25 SPIN

PLAN VIEW



T@2117 BS 11

HI = HT: 5.00

2119 5.00 CHK+11 <ERR 0.010 0.022>

2164 5.00 CHK+11 <ERR 0.010 0.015>

2118 ▲ SPIN

WC25

TENNIS COURTS

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC25

STREAM NAME: WALLER CREEK DATE: 10-04-07

LOCATION: PED BR US OF 15TH ST. CREW MOSELEY REED THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2166

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

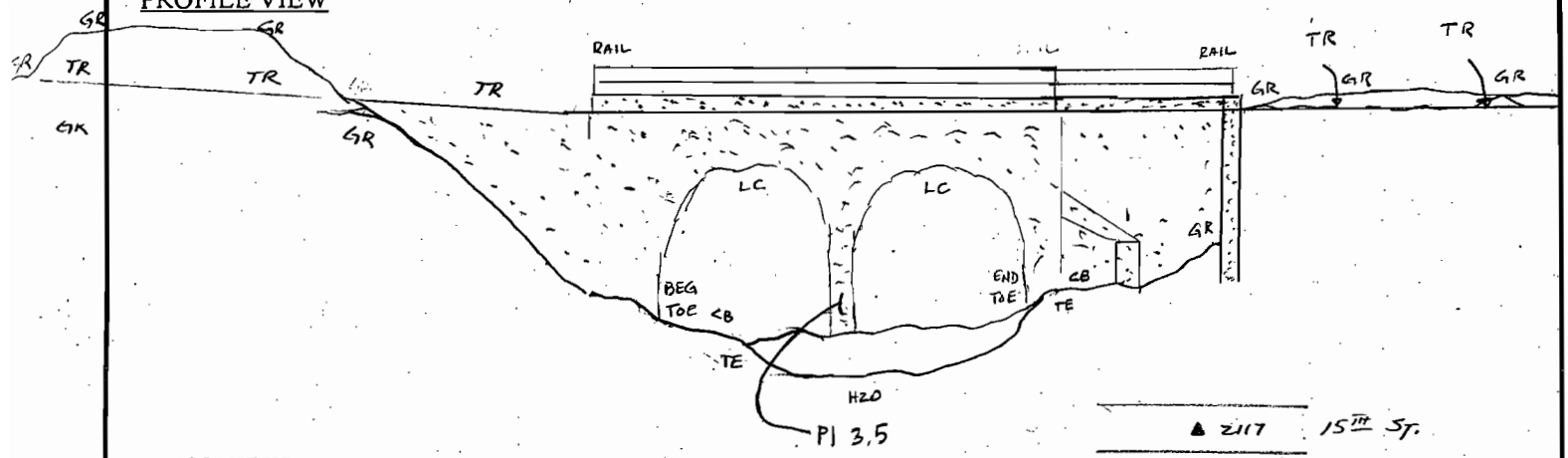
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US BK CRB @ E WALLER CREEK #2166

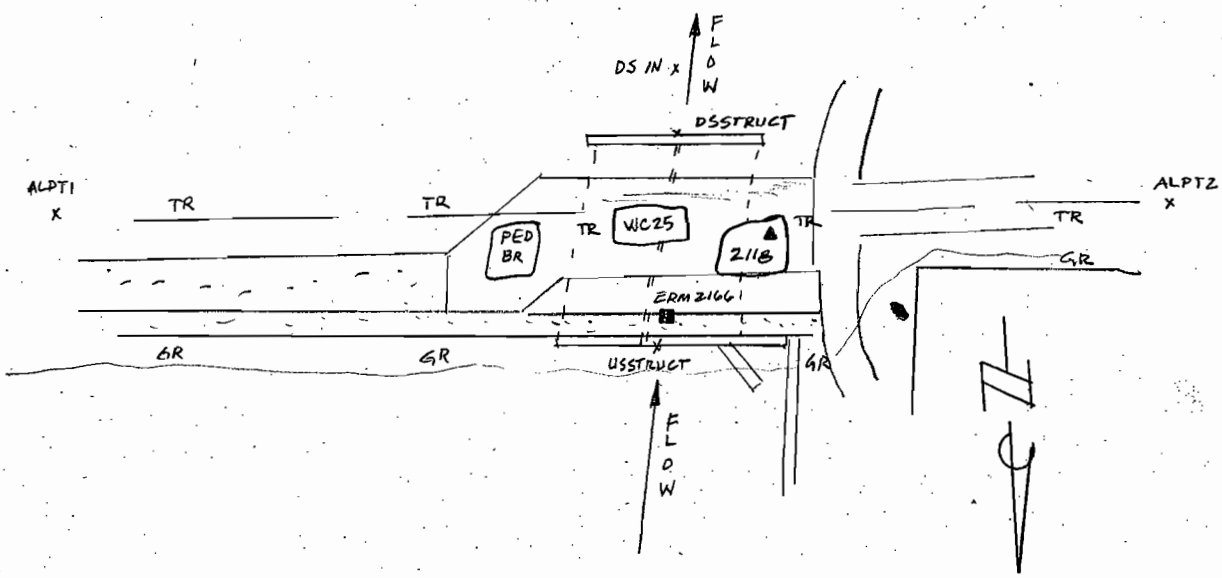
ADDL COMMENTS SHOTS 2165 - 2211

PED. BRIDGE / PTS TO GPS 2117-2118-11 / 400' US OF 15TH ST.

PROFILE VIEW



PLAN VIEW



T @ 2118 BS 2117

HI = 5.39 HT = 4.90

2165 4.90 CHK+2117 ⟨ERR 0.001, 0.030⟩

2166 ERM

2211 4.90 CHK+2117 ⟨ERR 0.017, 0.034⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC26 1 OF 3 SHTS

STREAM NAME: WALLER CREEK DATE: 10-05-07

LOCATION: 2ND PED BR US OF 15TH ST. (EAST OF UT TENNIS CNTR) CREW MOSELEY REED THOMASON

TYPE BR (Y) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2215

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

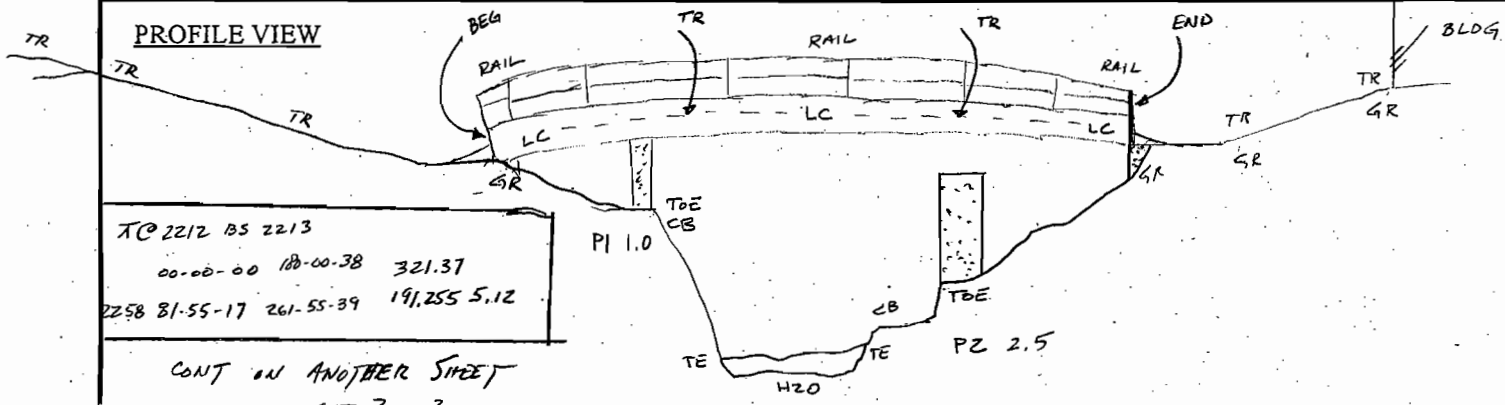
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "Δ" CUT ON US LEFT RAIL @ END SW BEGIN BR # 2215

ADDL COMMENTS SHOTS 2212 - 2273 2ND PED BR US OF 15TH

PTS TO GPS 2212 - 2213 WOOD PED BR. EAST OF UT TENNIS CNTER

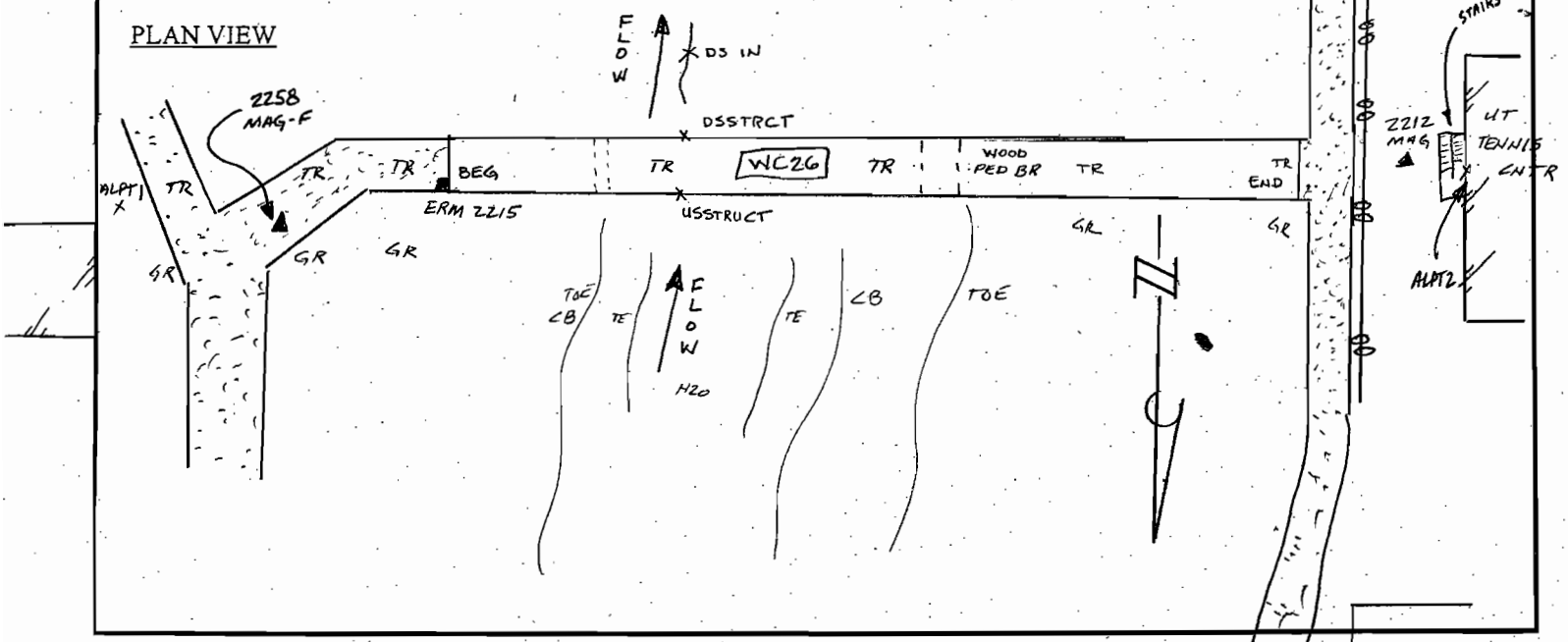
PROFILE VIEW



T@2212 BS 2213
00-00-00 180-00-38 321.37
2258 81-55-17 261-55-39 191,255 5.12

CONT ON ANOTHER SHEET
SHT 3 OF 3

PLAN VIEW



T@2212 BS 2213
HI = 5.40 HT = 4.89

2214 CHK+ 2213 ⟨ERR, 0.014 / 0.010⟩
2215
2258
2259 CHK+ 2213 ⟨ERR, 0.015 / 0.006⟩

WC27 PED BR

TENNIS CT

TO TRINITY ST.

2213 IRC-3

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC27

STREAM NAME: WALLER CREEK DATE: 10-08-07

LOCATION: 3RD PED BR US OF 15TH ST. CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2278

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

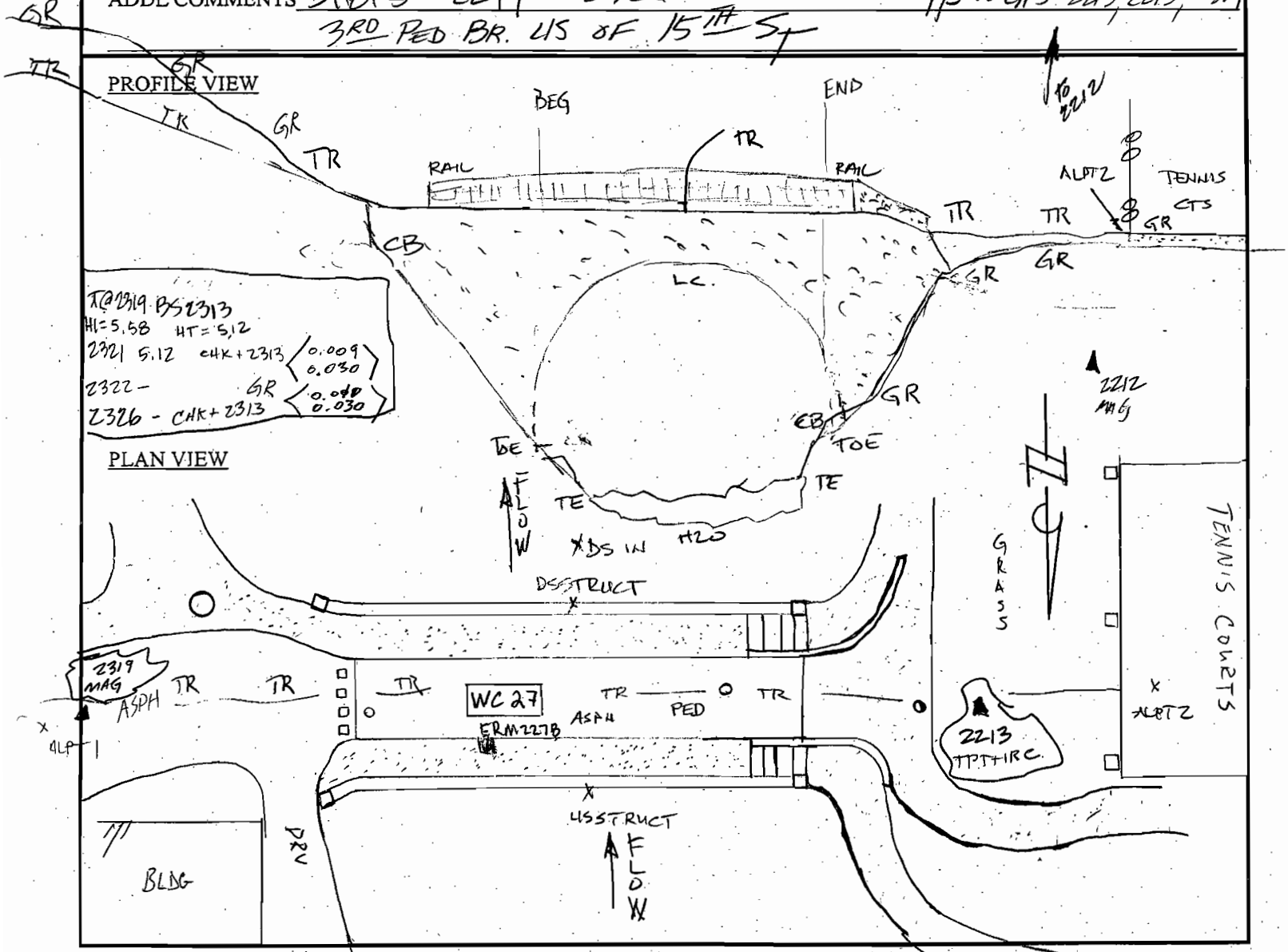
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" FND ON US BACK CRB @ ℄ WALLER CREEK

ADDL COMMENTS SHOTS 2277 – 2326 PTS TO GPS 2213, 2213, 2319

3RD PED BR. US OF 15TH ST

PROFILE VIEW



PLAN VIEW

T@2213 BS 2212
HI=5.14 HT=5.12
2277 5.12 CHK+2212 <0.007 0.030>
2278 5.80 ERM BR WC27
2320 5.12 CHK+2212 <0.013 0.039>

T@2213 BS 2212
HT=5.12

00-00-00 180-00-21 321.38
2319 265.28-02 85.28-33 231.98

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC28

STREAM NAME: Waller Creek DATE: 10-09-07

LOCATION: Trinity St. CREW Moseley Combs

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2331

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

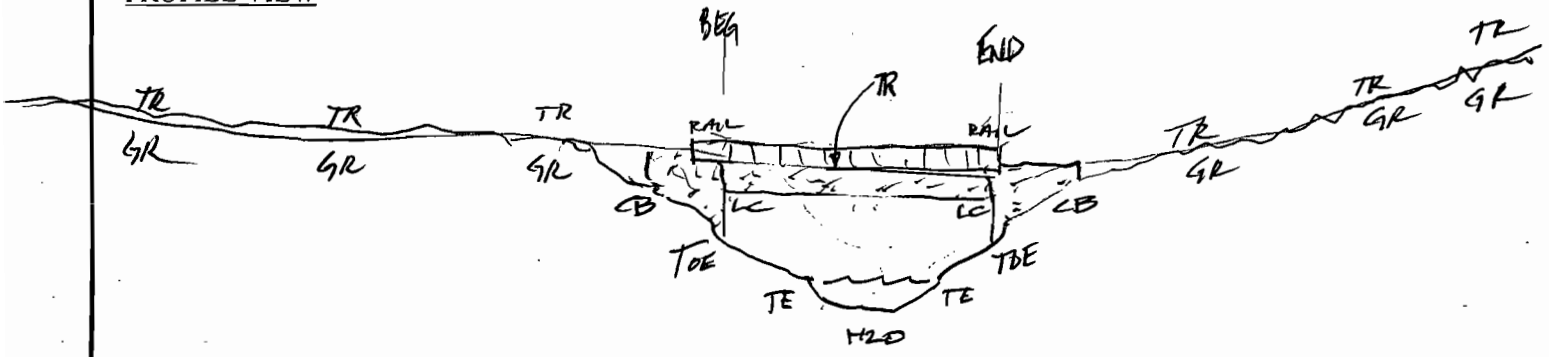
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "T" CUT ON US BACK CRB @ E WALLER CREEK

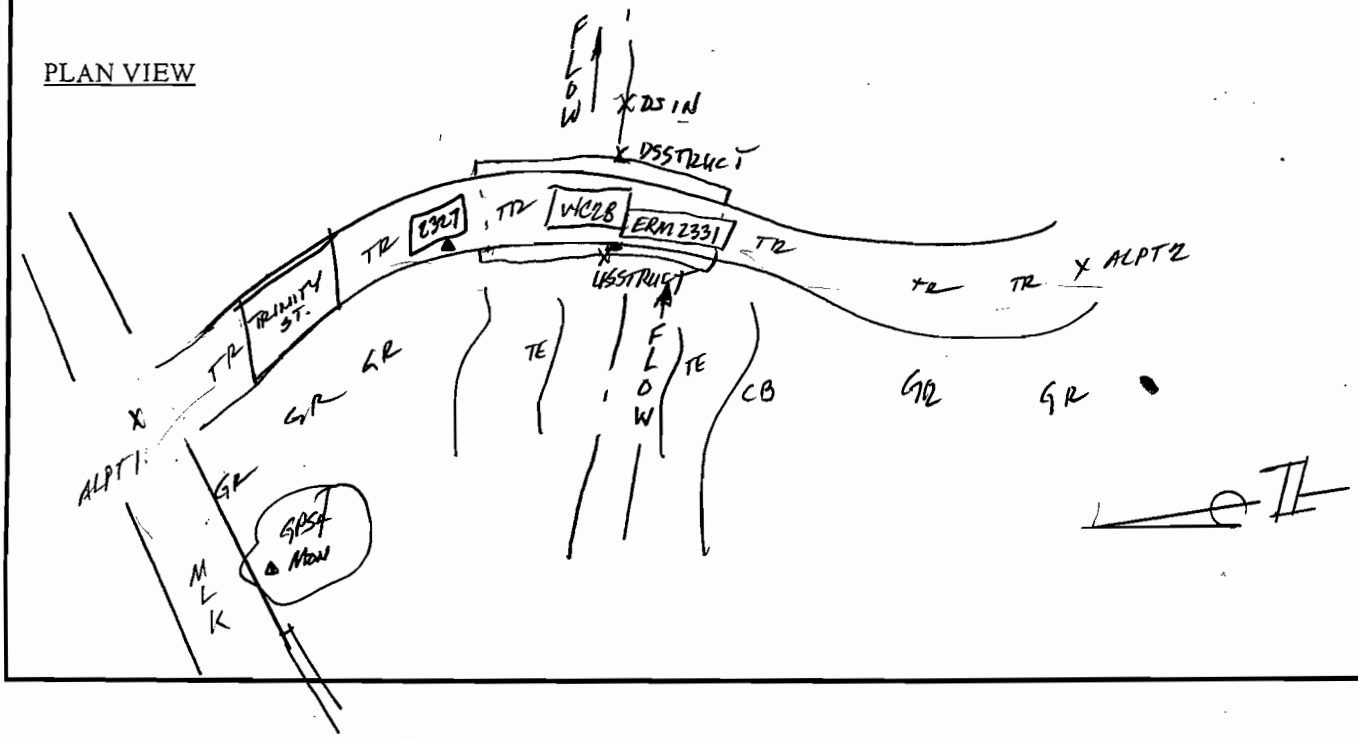
ADDL COMMENTS SHOTS 2327 – 2376

PTS TO GPS 2327, 2328, 2329

PROFILE VIEW



PLAN VIEW



TC@2327 BS 4
HI=5.55 HT=5.15

2330 - 2376 WC28

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC29

STREAM NAME: Waller Creek DATE: 10-09-07

LOCATION: Between Trinity & MLK (US of Trinity, DS of MLK) CREW Moseley Combs

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2379

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

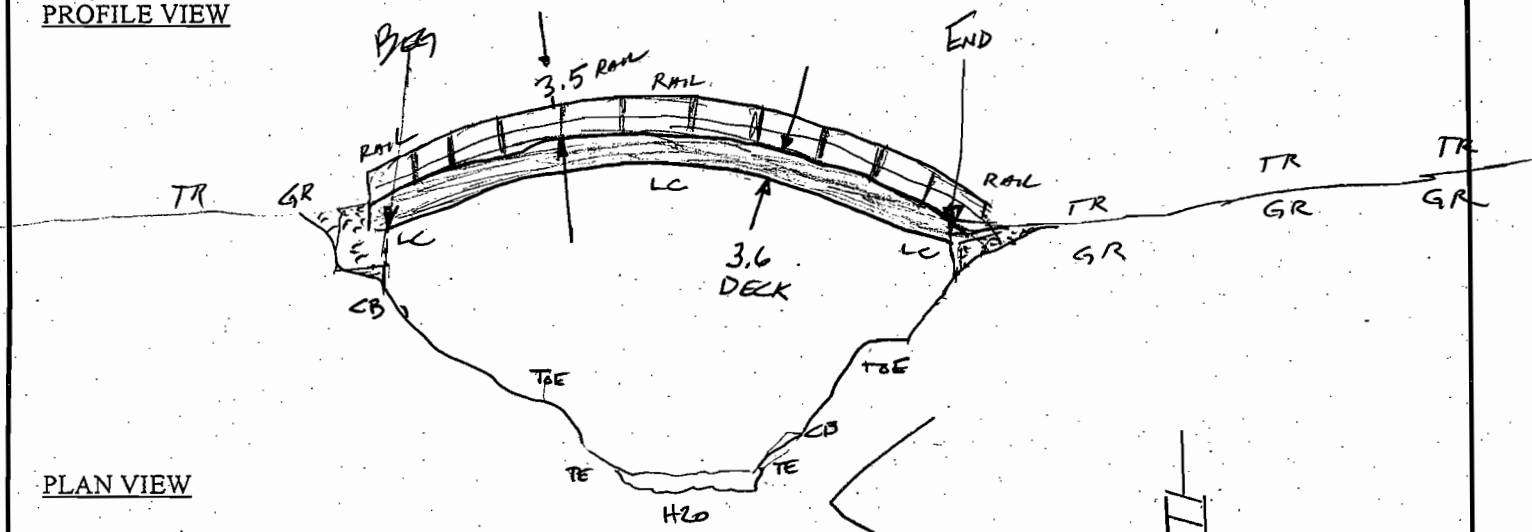
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US LEFT ABUTMENT @ #2379 BEG BR

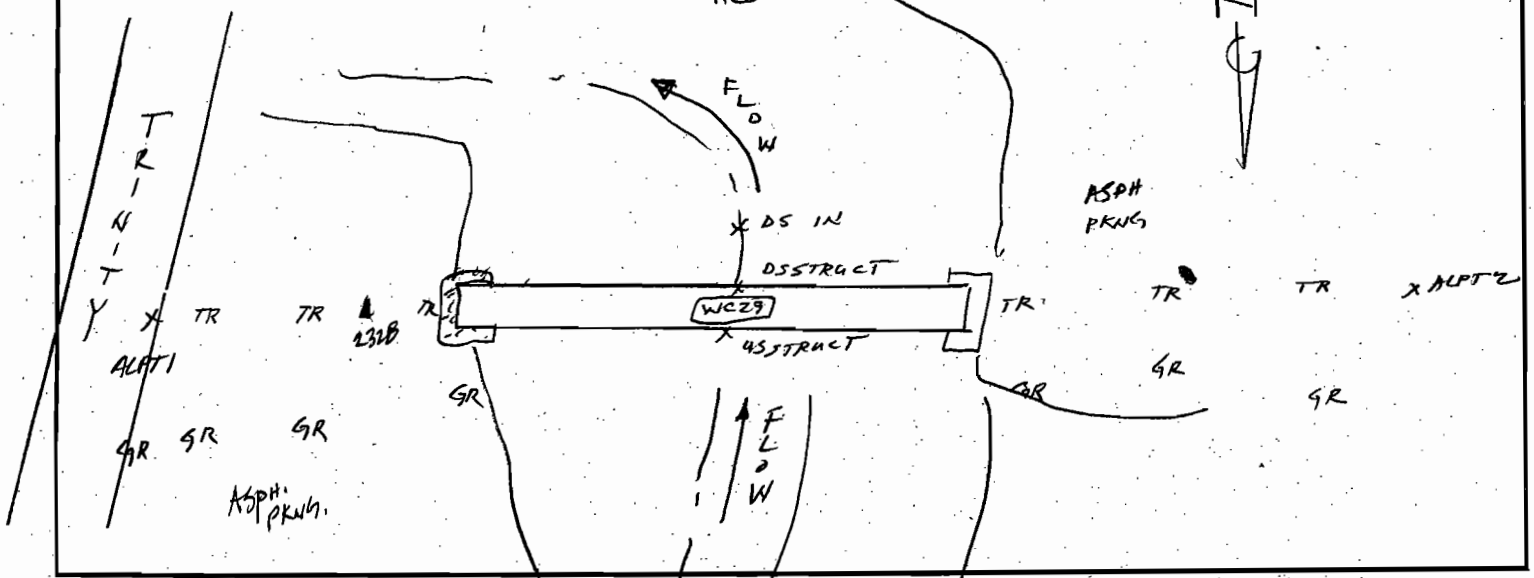
ADDL COMMENTS Shots 2377-2427

PED BRIDGE BETWEEN TRINITY & MLK (US of TRINITY DS of MLK)

PROFILE VIEW



PLAN VIEW



T @ 2328 BS 4
HI = 5.53 HT = 5.15
2377 5.15 CAK + 4
2378 5.30 CAK + 2327 ⟨ERR 0.016 / -0.003⟩ 143.46

⟨ERR 0.003 / 0.009⟩ 113.92

T @ 2328 BS 4 - CONT.
2379 - ERM
2380 - TOS
2427 - 5.15 CHK + 4

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC30

STREAM NAME: Waller Creek DATE: 10-09-07

LOCATION: MLK Blvd CREW Moseley Combs

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2431

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) 2 @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

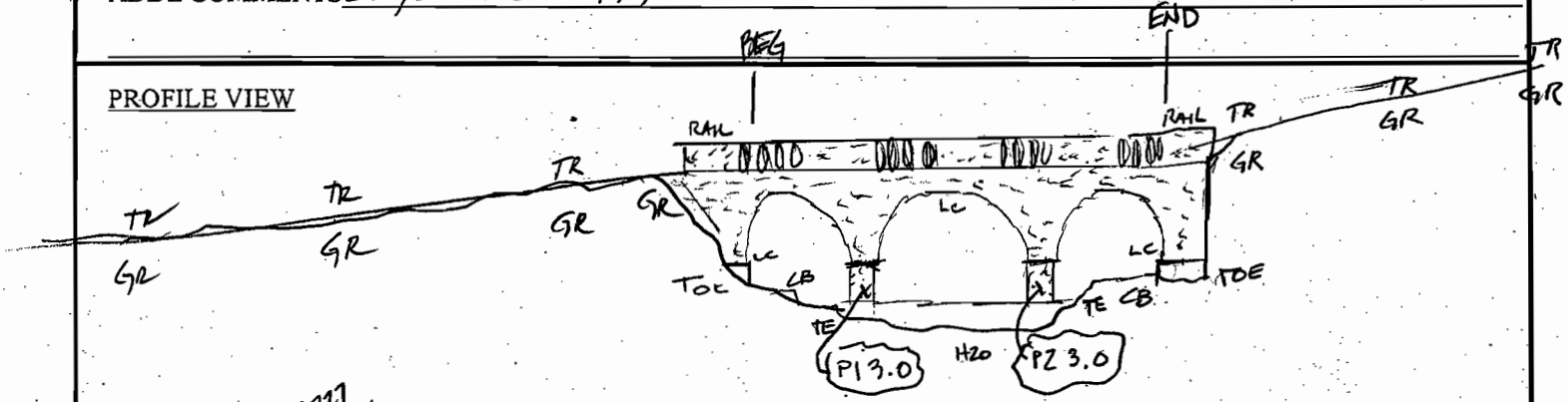
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

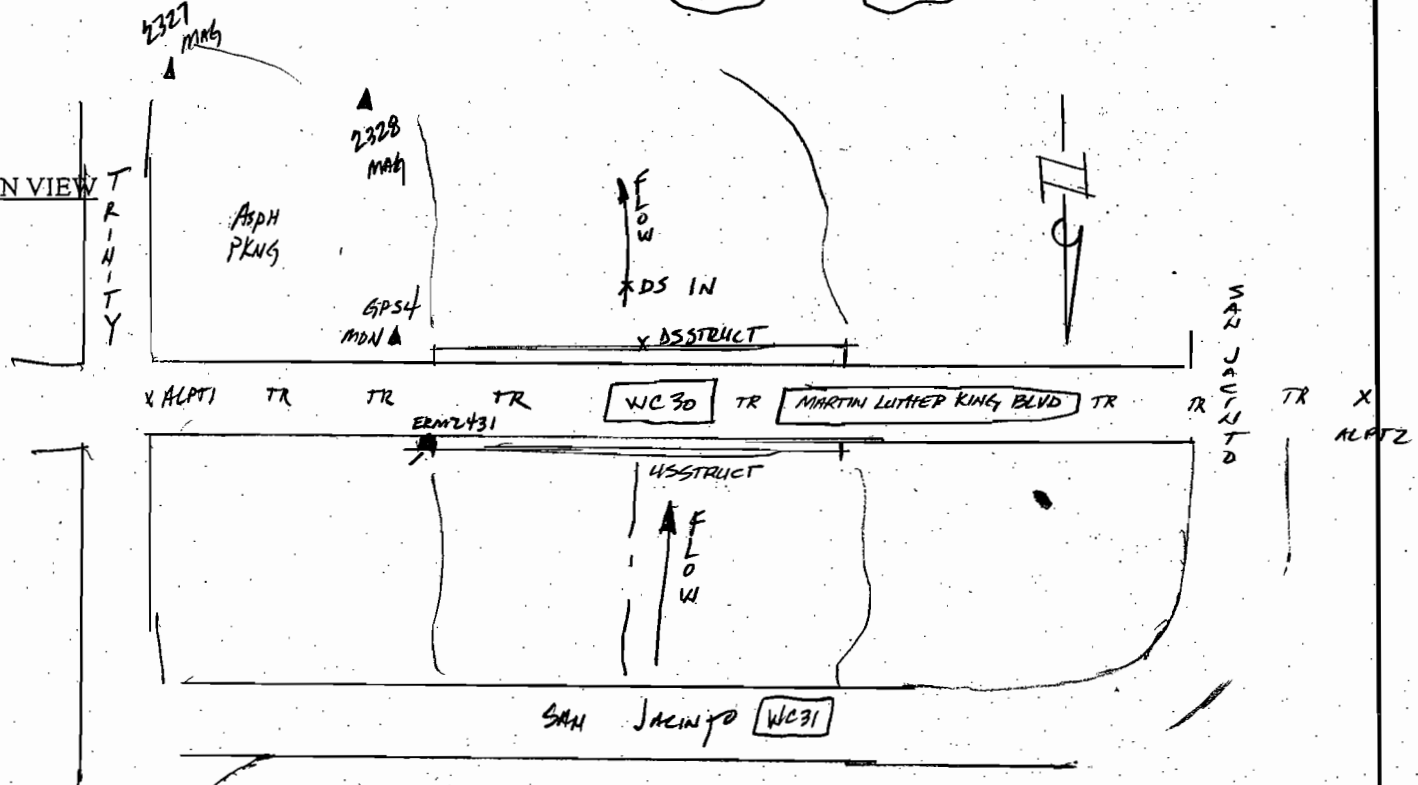
ERM DESCRIPTION: "□" CUT ON US LEFT BACK GRD @ ABUTMENT #2431

ADDL COMMENTS Shots 2428 – 2477

PROFILE VIEW



PLAN VIEW



TC4 / BS 2328

HI = 5.30 HT = 5.38 CHK

2428 5.38 CHK+2328 < 0.002 0.021 >

2429 5.30 CHK+2329 < 0.034 0.023 >

2430 5.12 CHK+2329 < 0.025 0.009 >

TC4, BS 2328 – CONT. –

2477 5.38 CHK+2328 < ELR. 0.003 0.027 >

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC31

STREAM NAME: WALLER CREEK DATE: 10-09-07

LOCATION: SAN JACINTO 1ST US OF MLK CREW MOSELEY COMBS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2480

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

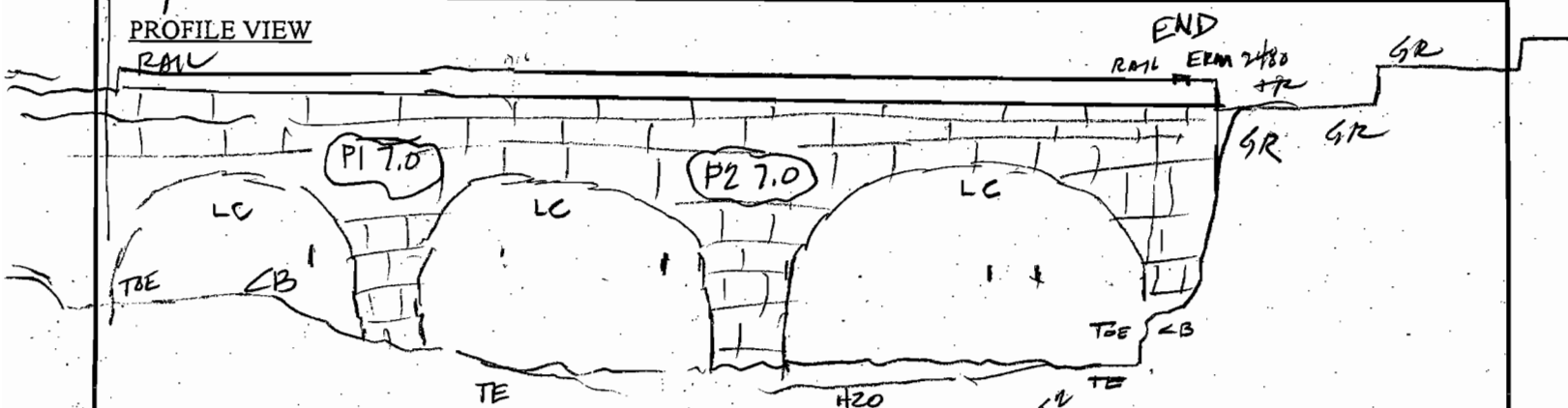
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: U.S. COAST & GEODETIC SURVEY MKR BRASS DISC FND. US LEFT RAIL

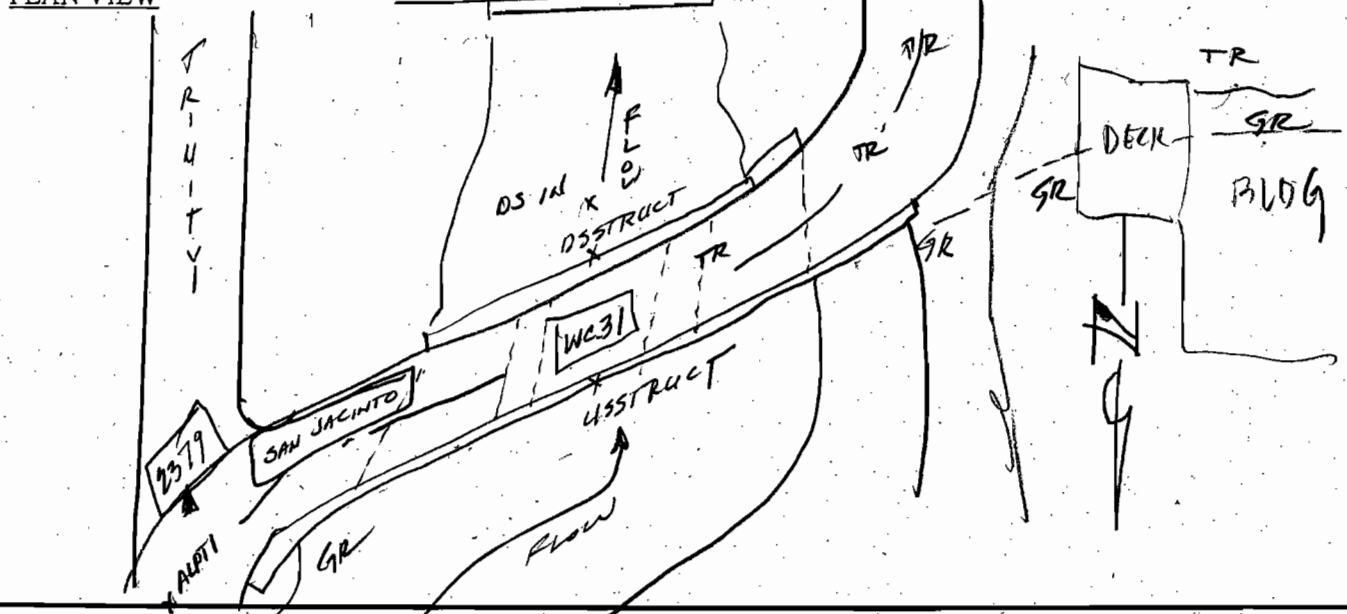
ADDL COMMENTS SHOTS 2478 - 2528

BEG

PROFILE VIEW



PLAN VIEW



T @ 2329 BS 4
HI = 5.48 HI = 5.00

2478 5.00 CHK +4 <ERR, 0.012> 382.50
2479 5.72 CHK+ 2327 <ERR 0.005> 463.42
2480 ERM BR WC31 0.074
2528 CHK +4 < 0.011 0.078 ERR>

T @ 2329 BS 4 - CONT. —

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC32

STREAM NAME: Waller Creek DATE: 10-09-07

LOCATION: Ped Br. @ Intersection Trinity & San Jac CREW Moseley Combs

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 2529

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

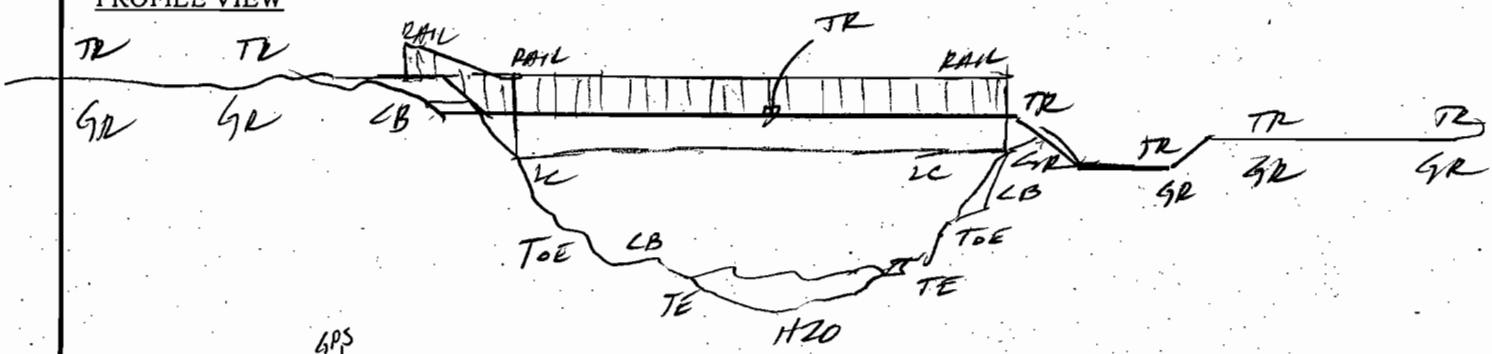
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" cut on DS left SW @ Top Abut

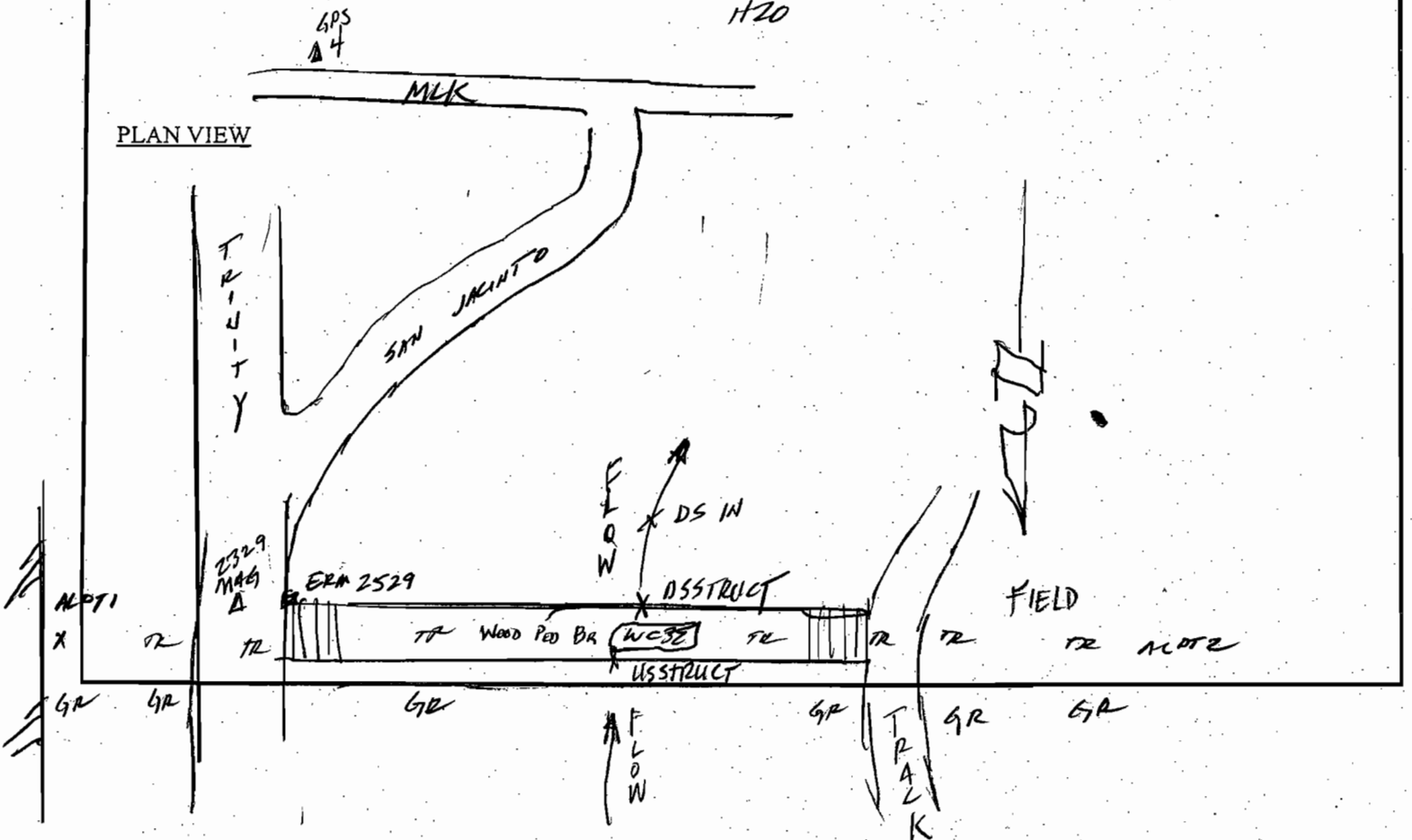
ADDL COMMENTS SHOTS 2527 – 2585

Wood Ped @ Intersection of Trinity & San Jacinto 2nd Br. US of MLK

PROFILE VIEW



PLAN VIEW



2585 5.00 CHK +4 (ERR 0.055 0.046)

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC33

STREAM NAME: Waller Creek DATE: 11-02-07

LOCATION: E 21st @ San Jacinto CREW Moseley Combs Schroeder

TYPE BR (N) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2589

BRIDGE RAIL 3.4 DECK ____ WIDTH ____ PIER(s) 2 @ 2.5 PIER SHAPE RD

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

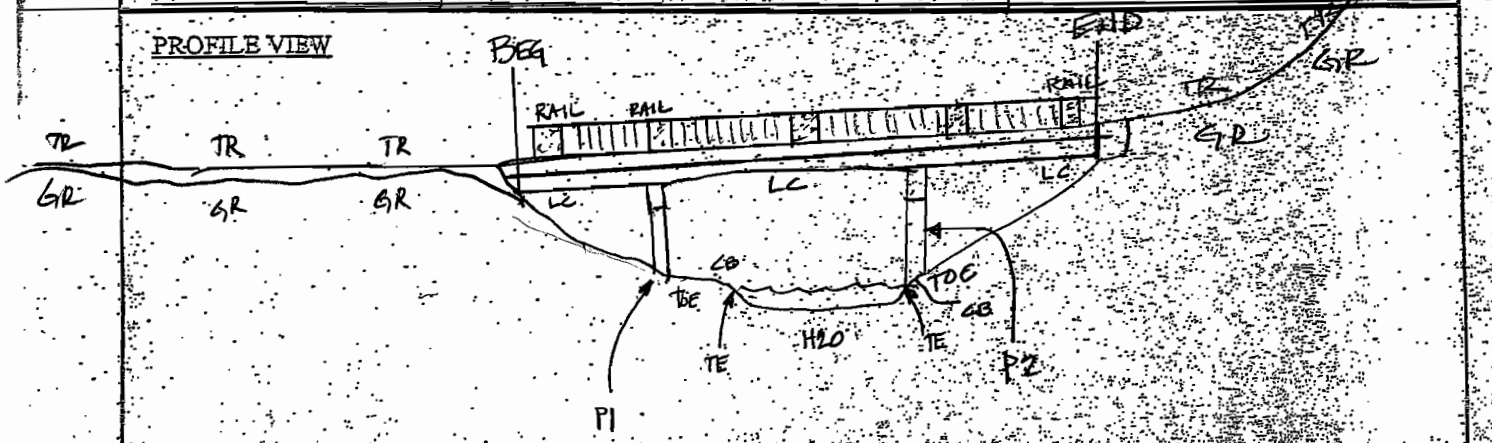
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: UT Brass Disc Fnd @ US Left Back Crb

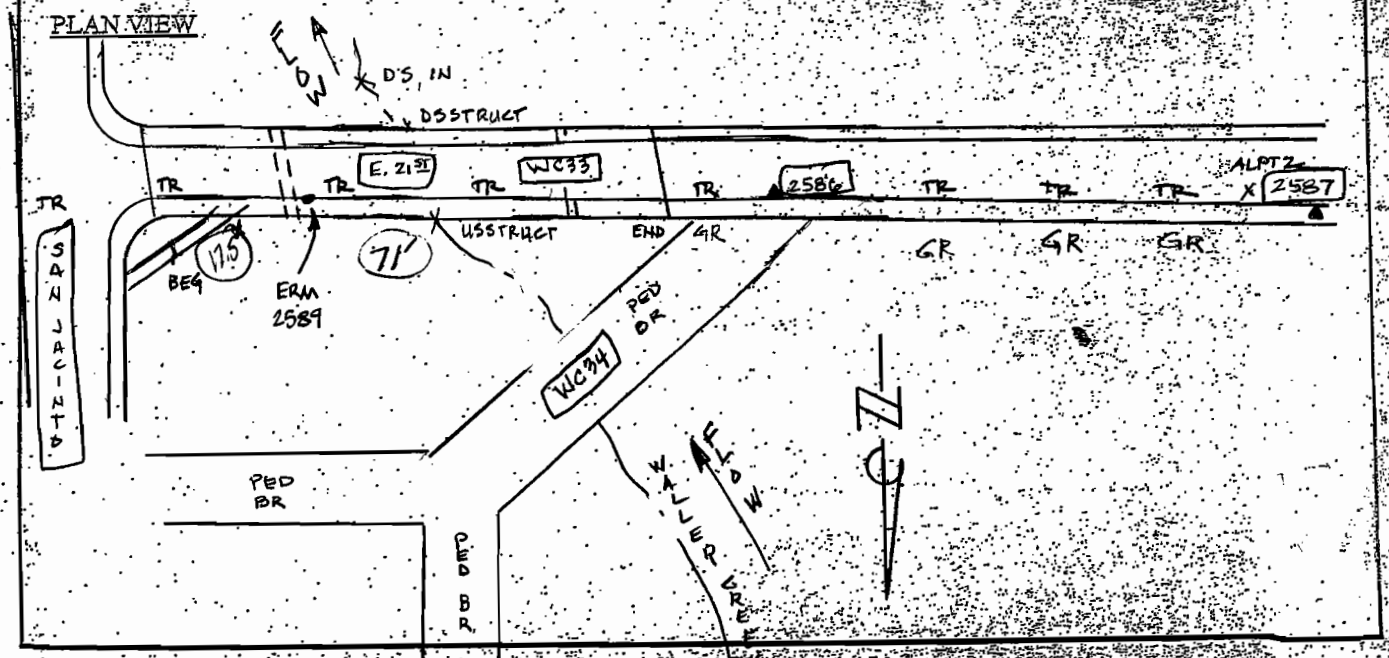
ADDL COMMENTS Shots 2588 - 2636

Pts To GPS - 2586, 2587 NOTE: PI Bridge

PROFILE VIEW



PLAN VIEW



T @ 2586; BS 2587

HI = 5.03 HT = 5.35

2588 5.35 CHK + 2587 (ERR. 0.01 0.01)

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 34 PED BR

STREAM NAME: WALLER CREEK DATE: 11-02-07

LOCATION: PED BR +/- 30' US OF WC 33 (E. 21ST ST.) CREW MOSELEY COMBS SCHROEDER

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2637

BRIDGE RAIL 3.4 DECK ____ WIDTH ____ PIER(s) 2 @ 1.5 PIER SHAPE RD

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

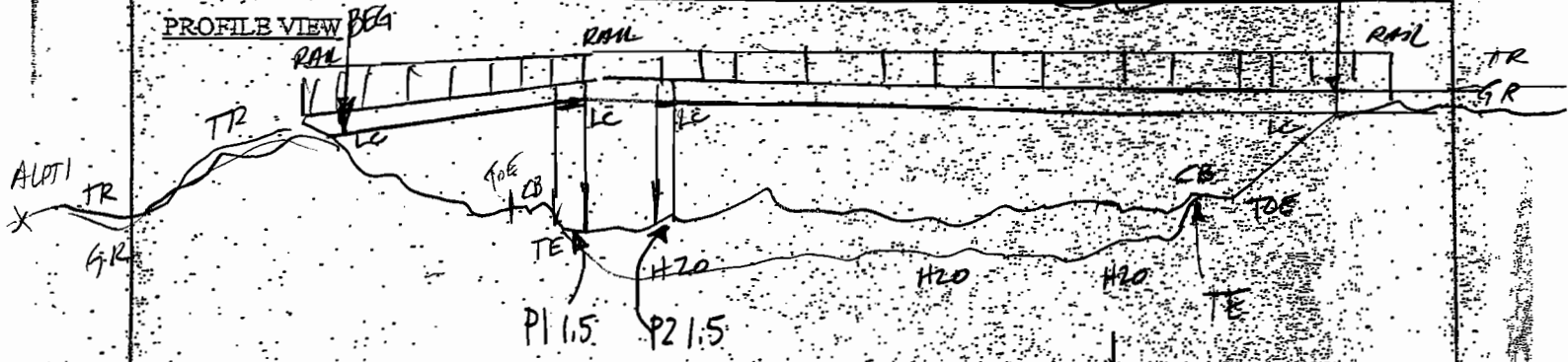
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: "┌┐" CUT ON US RIGHT TOP DECK @ BRICK BENCH SEAT

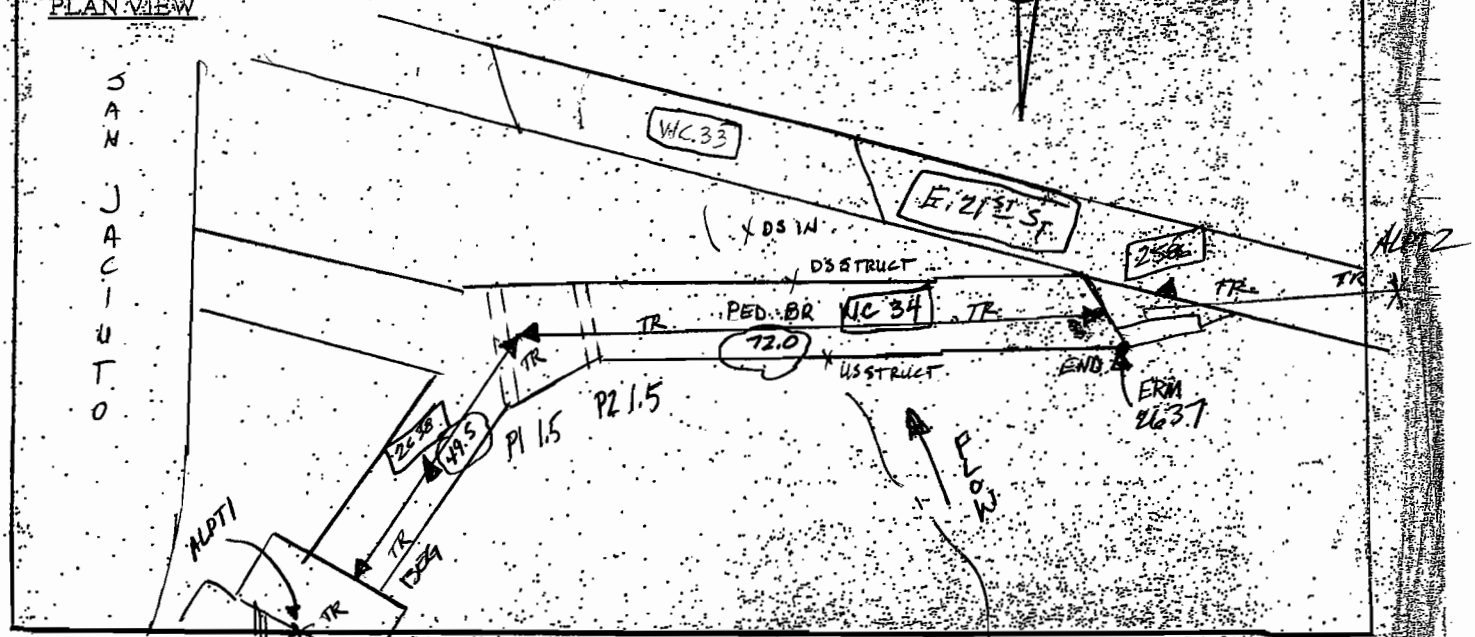
ADDL COMMENTS 2637 – 2672 | 2673 – 2690 NOTE: BRIDGE LENGTH

PTS TO GPS 2586 2587 | ⍐ @ 2586 | ⍐ @ 2638

PROFILE VIEW



PLAN VIEW



⍐ @ 2586 BS 2587
HI = 5.03 HT = 5.35
2636 CHK + 2587
2672 CHK + 2587

⍐ @ 2638 BS 2586
HI = 5.35 HT = 4.78
2673 4.78 CHK + 2586
2690 CHK + 2586

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC35 BR

STREAM NAME: WALLER CREEK DATE: 11-02-07

LOCATION: N. END ALUMNI CENTER / DS OF E. 22ND ST. CREW MOSELEY COMBS SCHROEDER

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2694

BRIDGE RAIL 2.5 DECK WIDTH PIER(s) 2 @ 3.0 PIER SHAPE SQ

CULVERT NUM# SHAPE LENGTH SIZE H: W: SKEW

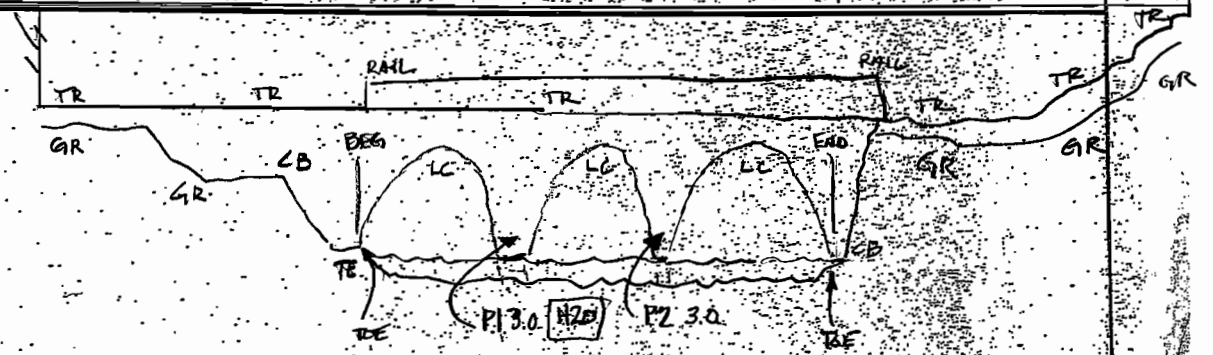
CULVERT I/O TYPE MATERIAL WINGWALL US: DS:

DAM TOP WIDTH SIDE SLOPE US DS RISER X SPY#

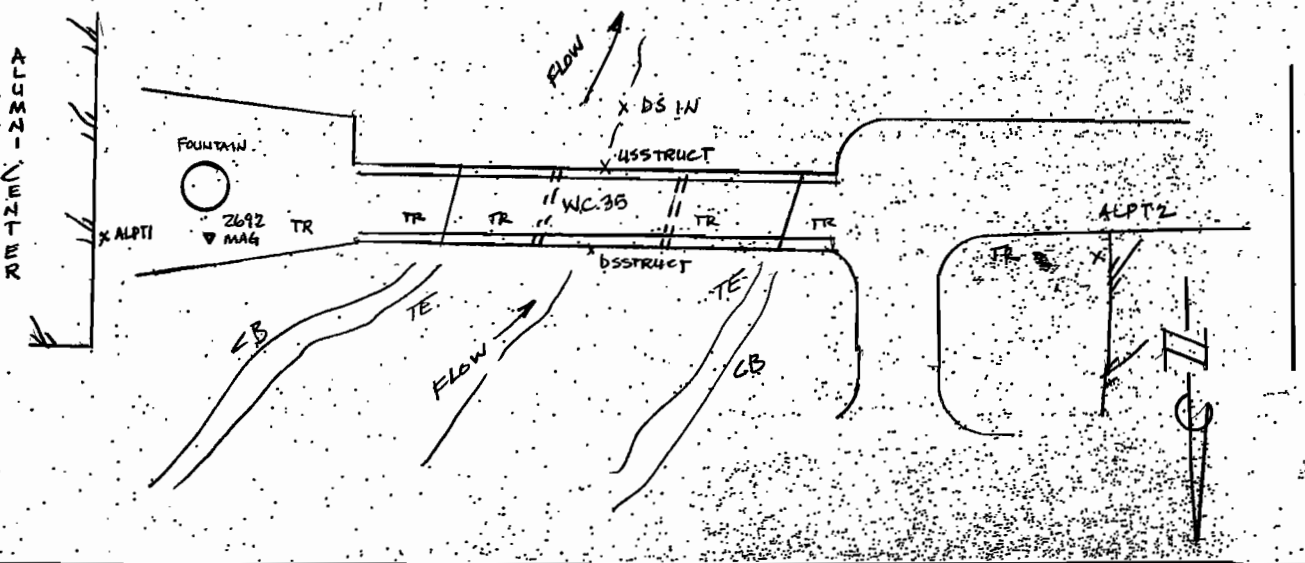
ERM DESCRIPTION: "□" CUT ON US LEFT TOP RAIL #2694

ADDL COMMENTS 2691 - 2734
PED BR.

PROFILE VIEW



PLAN VIEW



T @ 2692 BS 2691
HI = 5.44 HT = 5.31
2695 CHK = 2691 2735 CHK = 2691
2694 ERR <ERR 0.01
0.01

SHT 3 OF 7

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC36

STREAM NAME: Waller Creek DATE: 11-05-07

LOCATION: E. 23RD St. CREW Moseley Combs Schroeder

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2737

BRIDGE RAIL VARIES DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

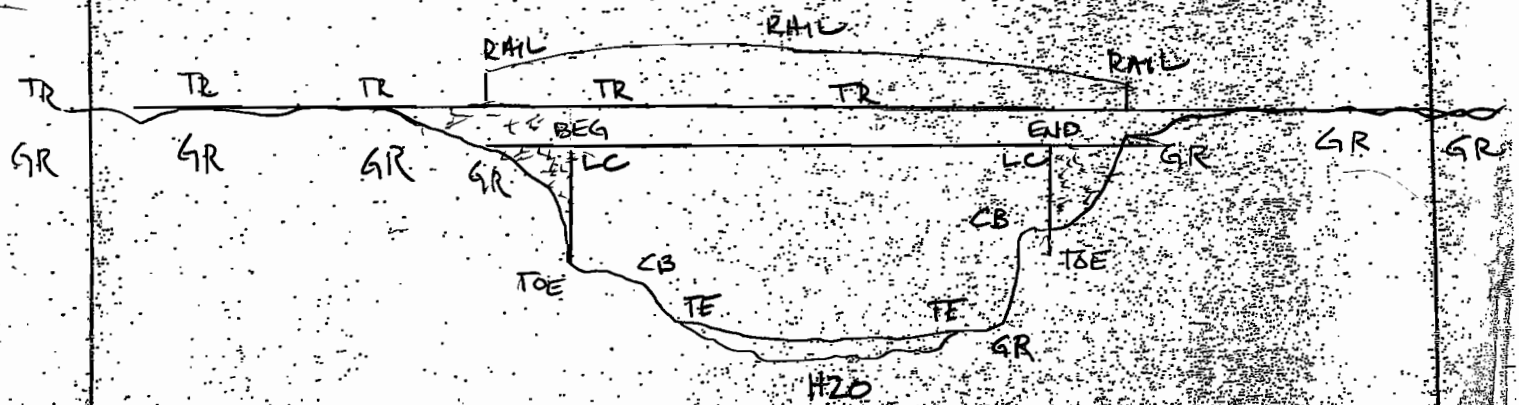
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: "□" CUT ON US RIGHT Top Rail

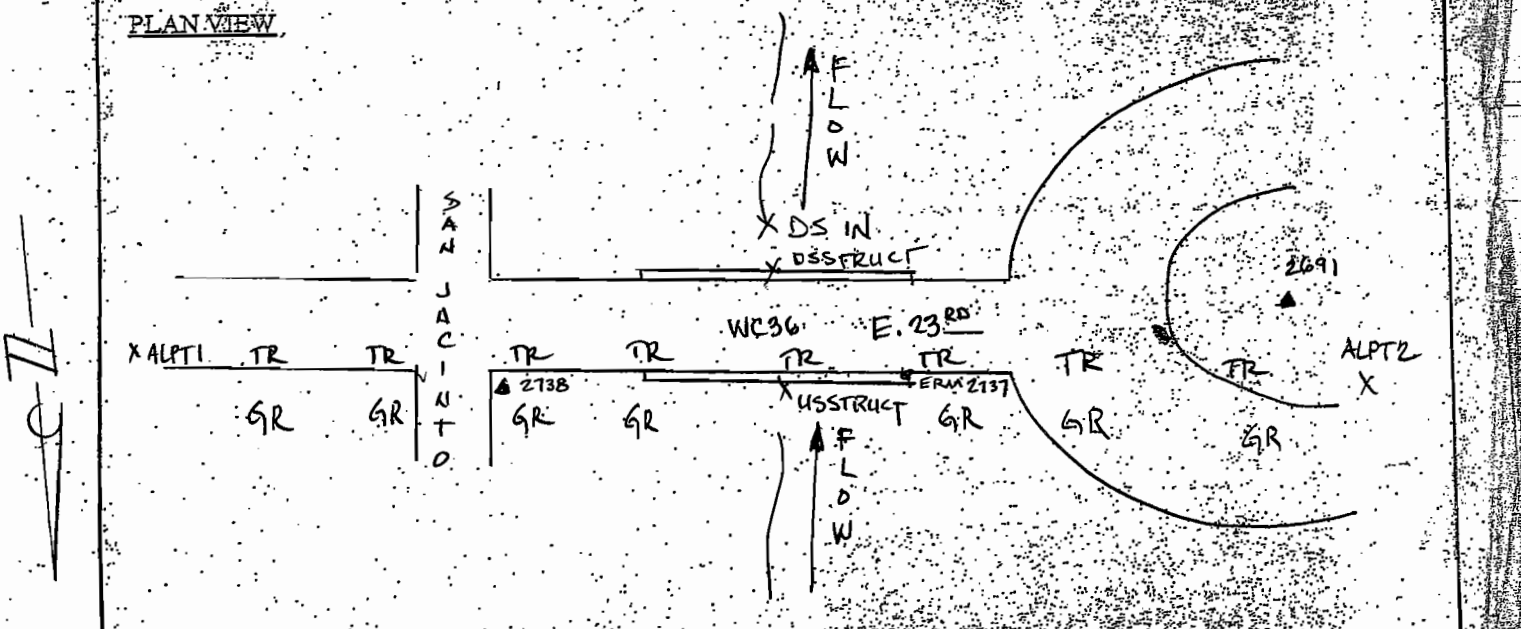
ADDL COMMENTS 2736 - 2786

PTS TO GPS 2691, 2692, 2738

PROFILE VIEW



PLAN VIEW



PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 37 Ped Br

STREAM NAME: Waller Creek DATE: 11-05-07

LOCATION: 1st Ped Br. US of E. 23rd St. CREW Moseley Combs Schroeder

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2793

BRIDGE RAIL 3.5 DECK ____ WIDTH ____ PIER(s) 1 @ 2.0 PIER SHAPE RD

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

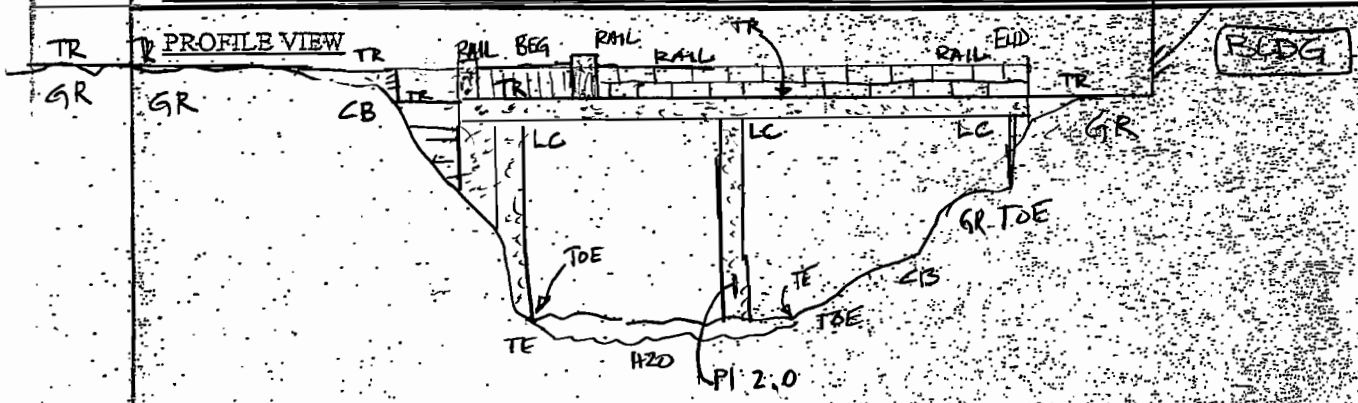
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

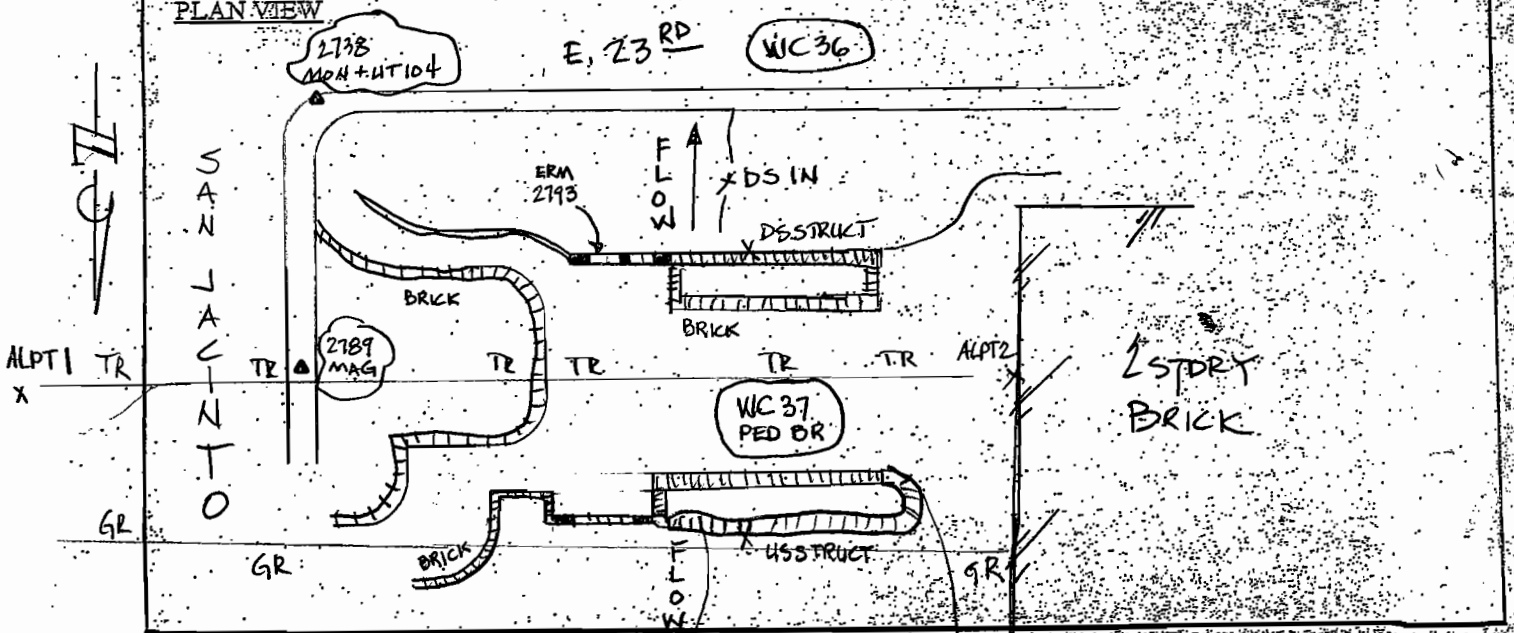
ERM DESCRIPTION: "□" cut on DS left Top Deck @ left Rail

ADDL COMMENTS Shots 2791 - 2836 Ped Br.

PROFILE VIEW



PLAN VIEW



A @ 2789 BS 2738

AT = 5.50 HI = 4.93

2791 4.93 CHK+2738 ⟨0.02 / 0.02⟩

2836 4.93 CHK+2738 ⟨0.02 / 0.02⟩

180-00-01 85.72

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 38 Ped Br

STREAM NAME: Waller Creek DATE: 11-05-07

LOCATION: 2nd Ped Br. US of E. 23rd CREW Moseley Combs Schroeder

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2838

BRIDGE RAIL 3.5 DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

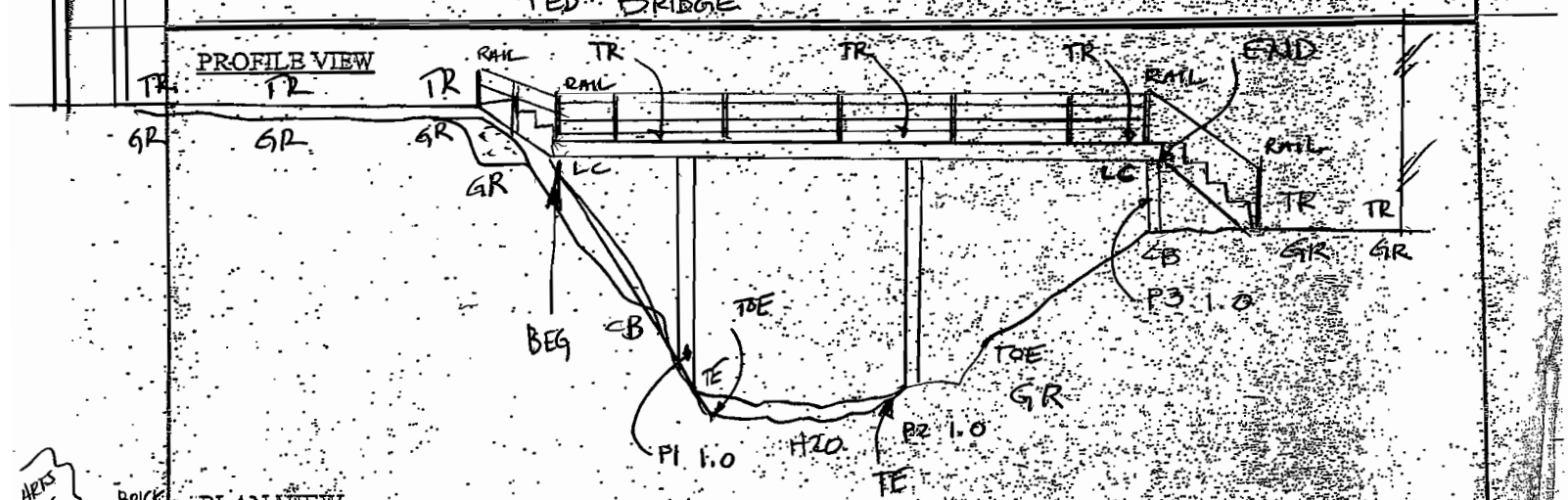
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

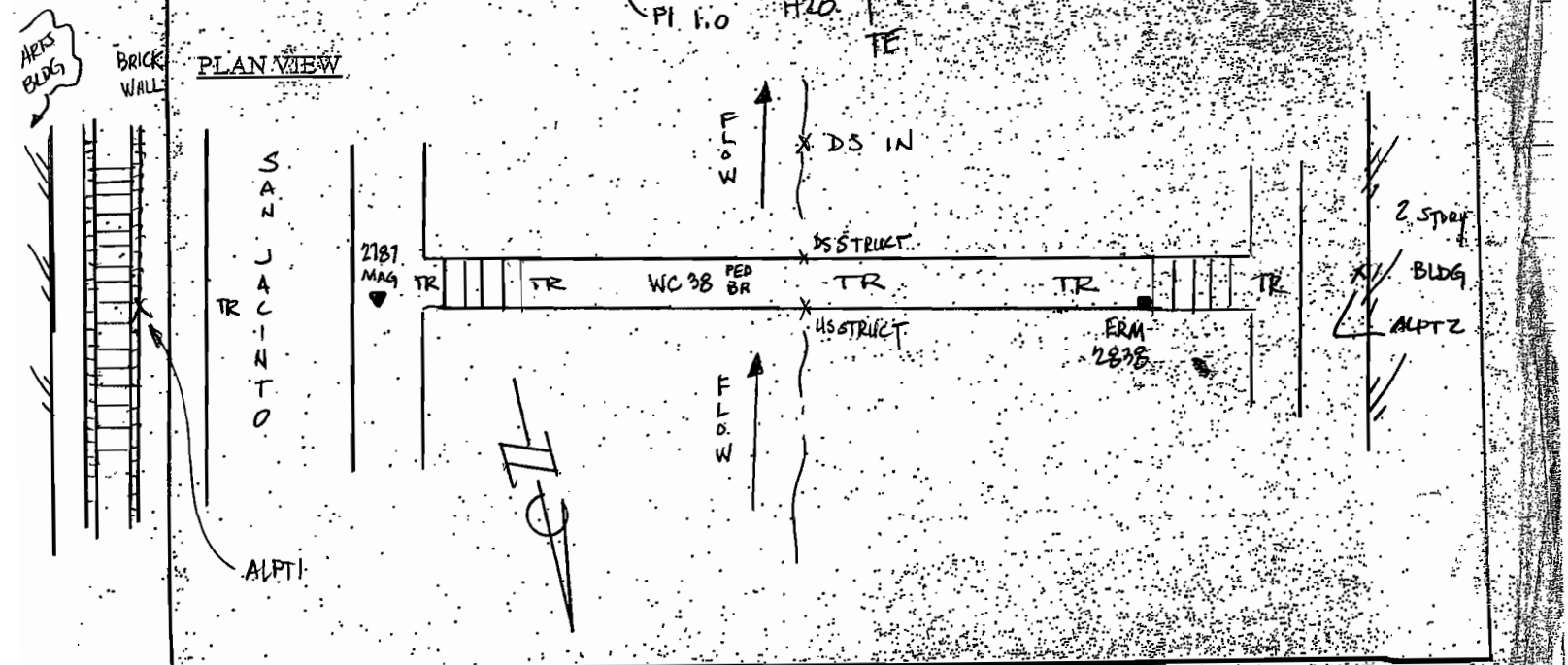
ERM DESCRIPTION: "D" cut on US Right Top Deck @ Steps

ADDL COMMENTS 2837 - 2879 2nd Ped Br. US of E. 23rd Ped Bridge

PROFILE VIEW



PLAN VIEW



T @ 2787 BS 2738
5.48 HT = 4.93

2837 CHK = 2738 0.02
2838 CHK = 2838 0.02
2879 CHK = 2738 0.02
0.02
0.02
0.02

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 39

STREAM NAME: Waller Creek DATE: 11-05-07

LOCATION: E 24TH ST. CREW Moseley Combs Stoeroeder

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2883

BRIDGE RAIL 3.5 DECK ____ WIDTH ____ PIER(s) 2 @ 2.0 PIER SHAPE RD

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

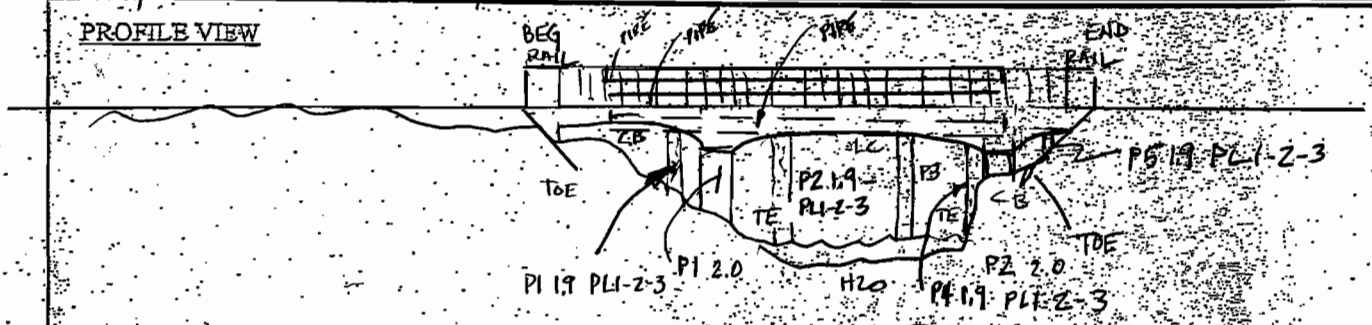
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: UT MON #17 FND @ US. LEFT SW

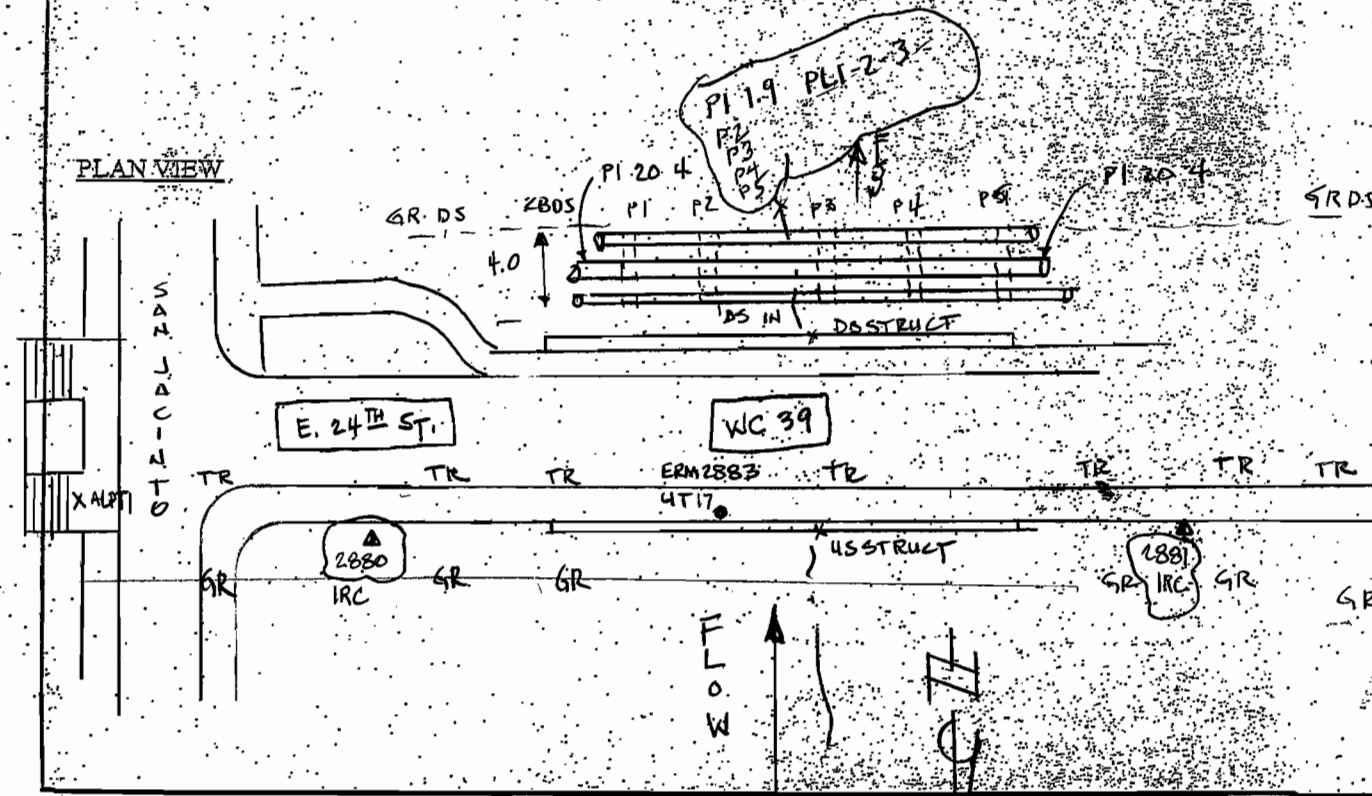
ADDL COMMENTS SHOTS 2882 - 2948

Pts. To GPS 2880, 2881

PROFILE VIEW



PLAN VIEW



T @ 2880 BS 2881

HT = 5.38 HI = 5.35

2882 CHK + 2881

2948 CHK + 2881

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME BR WC40

STREAM NAME: WALLER CREEK DATE: 11-08-07

LOCATION: SAN JACINTO 1ST BR DS OF DEAN KEETON CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 30066

BRIDGE RAIL ____ DECK ____ WIDTH ____ PIER(s) 1 @ 5.0 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

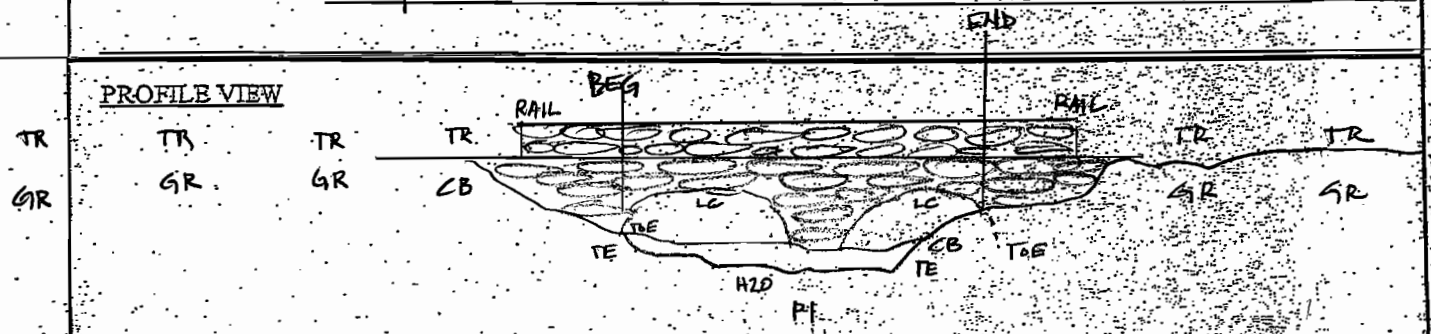
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

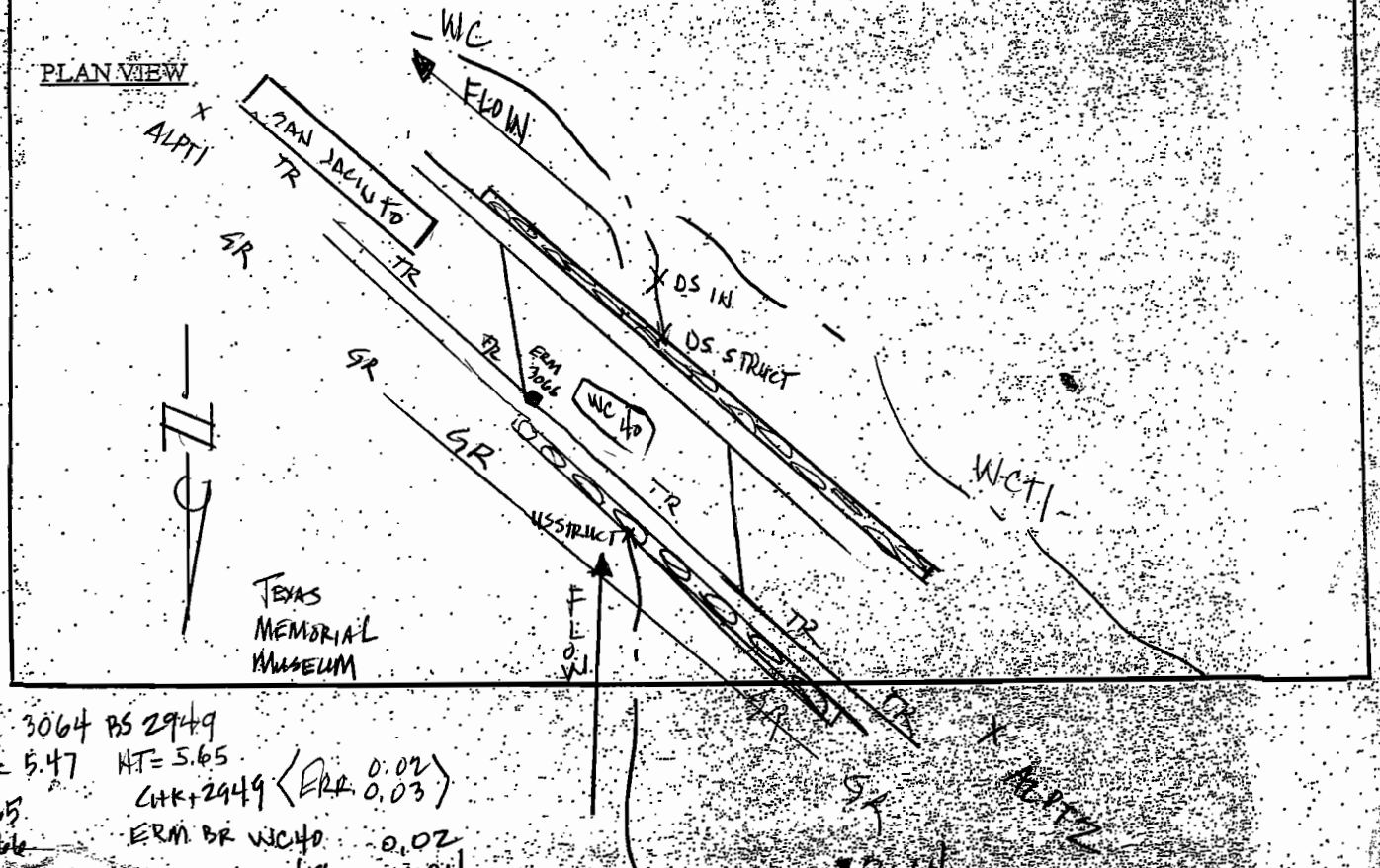
ERM DESCRIPTION: "□" CUT ON US LEFT CRB @ BEG. BRIDGE # 30066

ADDL COMMENTS SHOTS 3064 - 3104

PROFILE VIEW



PLAN VIEW



@ 3064 BS 2949
HI = 5.47 HT = 5.65
CHK 2949 ⟨ERR 0.02⟩
3065
3066 ERM BR WC40 0.02
3104 CHK 2949 0.04

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC41 Ped Br.

STREAM NAME: Waller Creek DATE: 11-08-07

LOCATION: Ped Br. Between San Jacinto & Dean Keeton CREW Moseley Combs Thomason

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 3105

BRIDGE RAIL ____ DECK ____ WIDTH ____ PIER(s) 3 @ 1.0 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

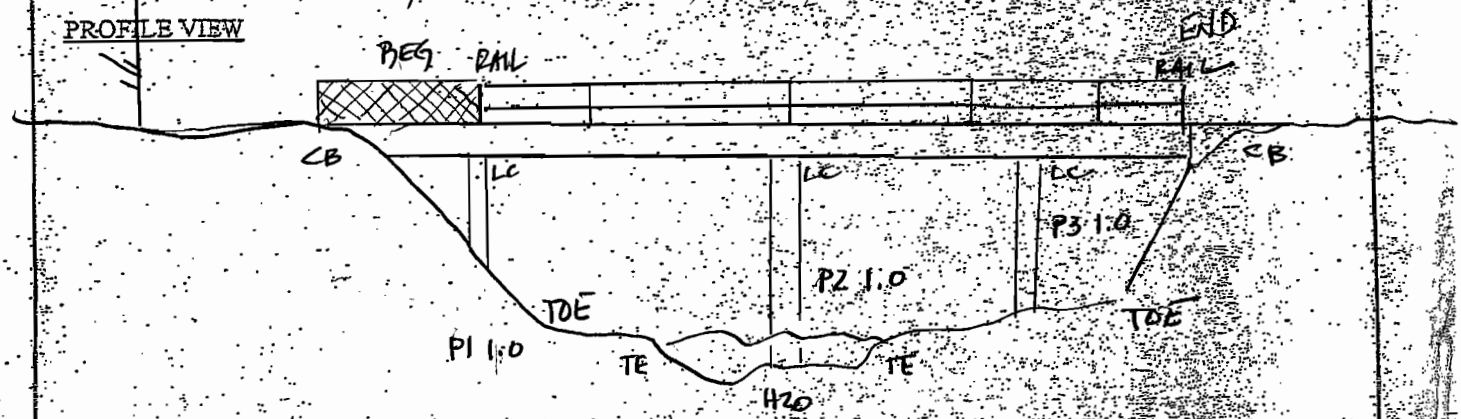
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPV# ____

ERM DESCRIPTION: "□" cut on US Left Top Deck @ Beg Br.

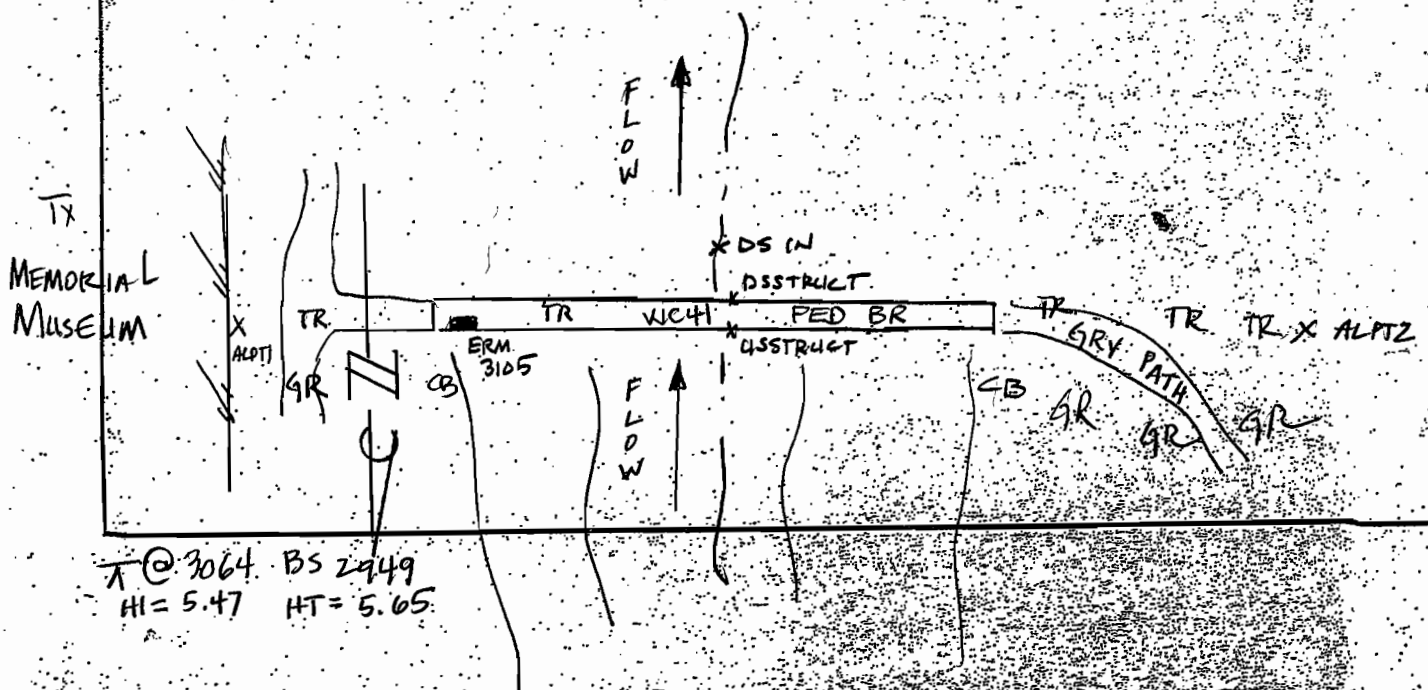
ADDL COMMENTS Shots 3105-3144

Pts to GPS 3064

PROFILE VIEW



PLAN VIEW



↑ @ 3064 BS 2949
HI = 5.47 HT = 5.65

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC42

STREAM NAME: WALLER CREEK DATE: 11-12-07

LOCATION: DEAN KEETON CREW MOSELEY COMBS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3150

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 1 @ 1.3 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

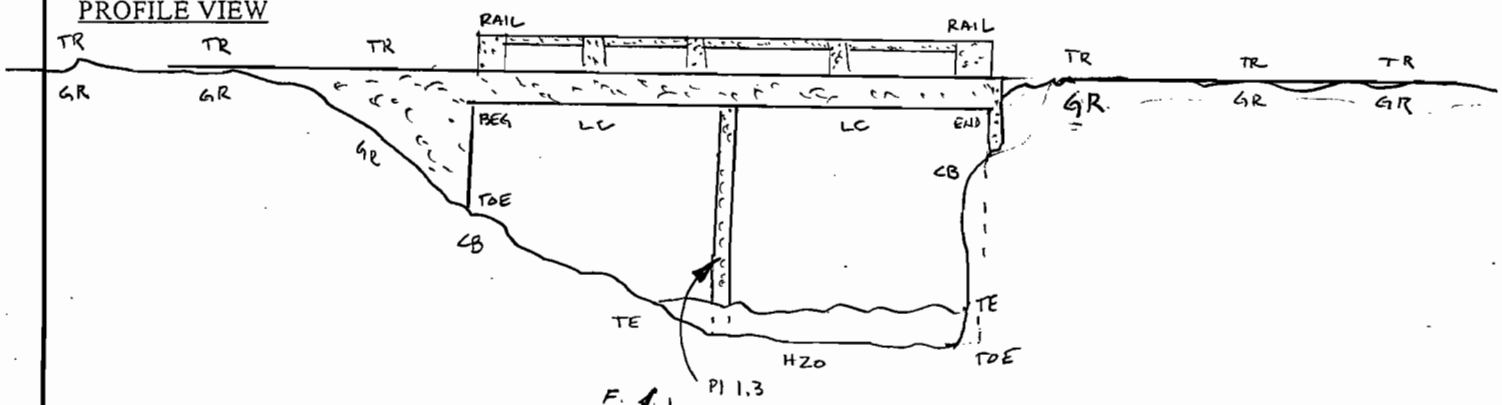
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

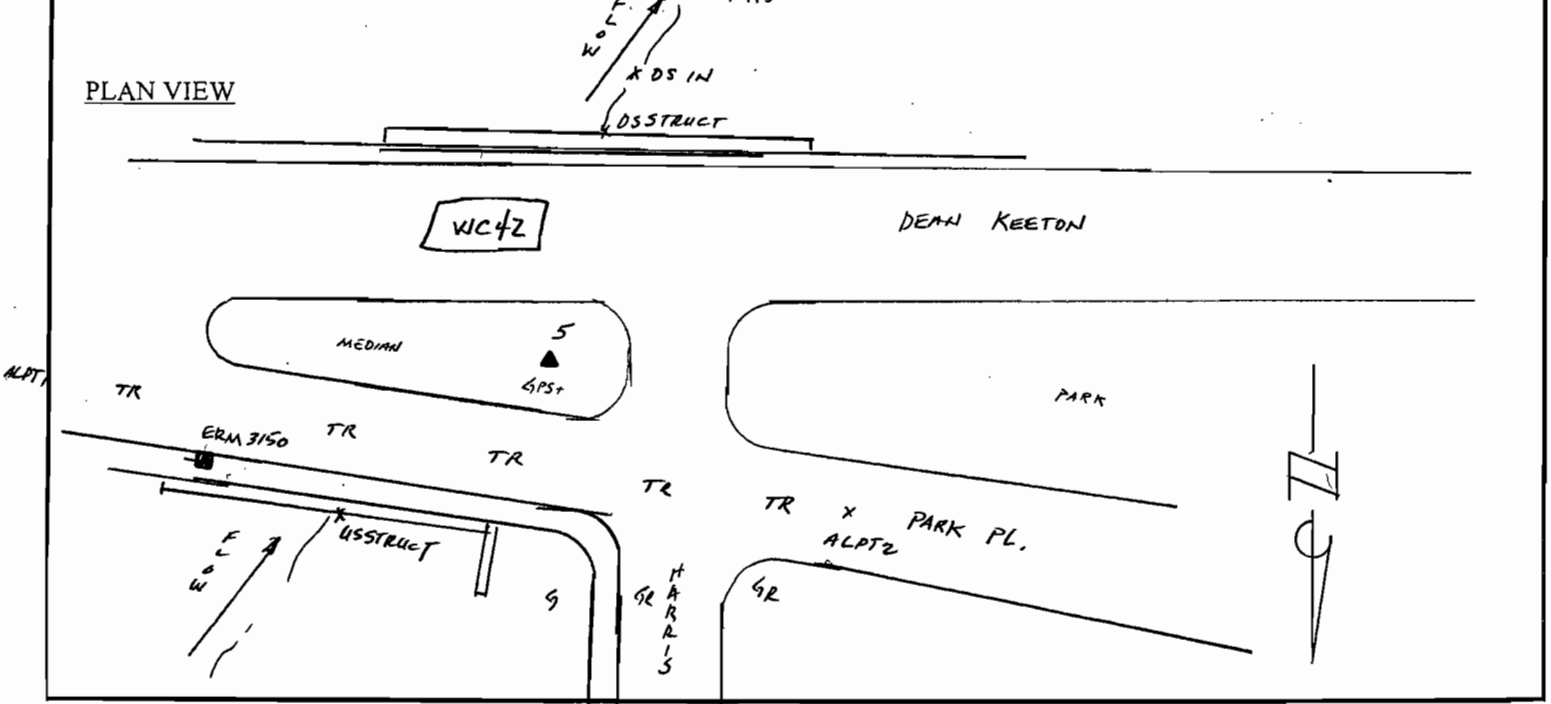
ERM DESCRIPTION: "□" CUT ON US LEFT CRB @ BEG. BRIDGE

ADDL COMMENTS SHOTS 3149 – 3194

PROFILE VIEW



PLAN VIEW



T@5; BS 2949

HI = 5.36 HT = 5.48

3149 5.48 CHK = 2949 ⟨ERR 0.06 0.07⟩

3194 5.48 CHK = 2949 ⟨ERR. 0.06 0.07⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME PED BR. WC43

STREAM NAME: WALLER CREEK DATE: 11-12-07

LOCATION: HARRIS PARK CREW MOSELEY COMBS THOMASON

TYPE BR (X) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3198

BRIDGE RAIL 3.5 DECK 0.5 WIDTH 6.5 PIER(s) — @ — PIER SHAPE —

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H:____ W:____ SKEW ____

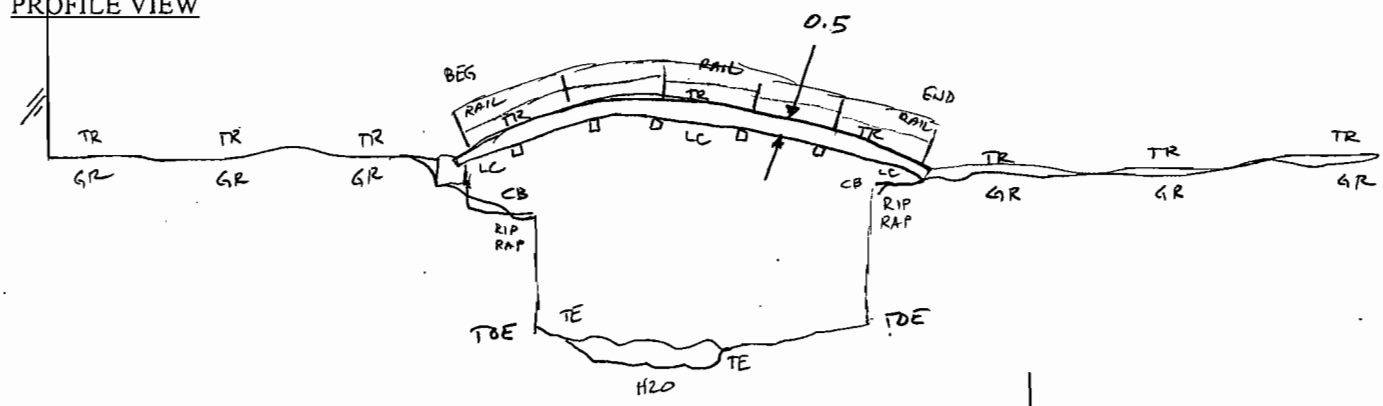
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US:____ DS:____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

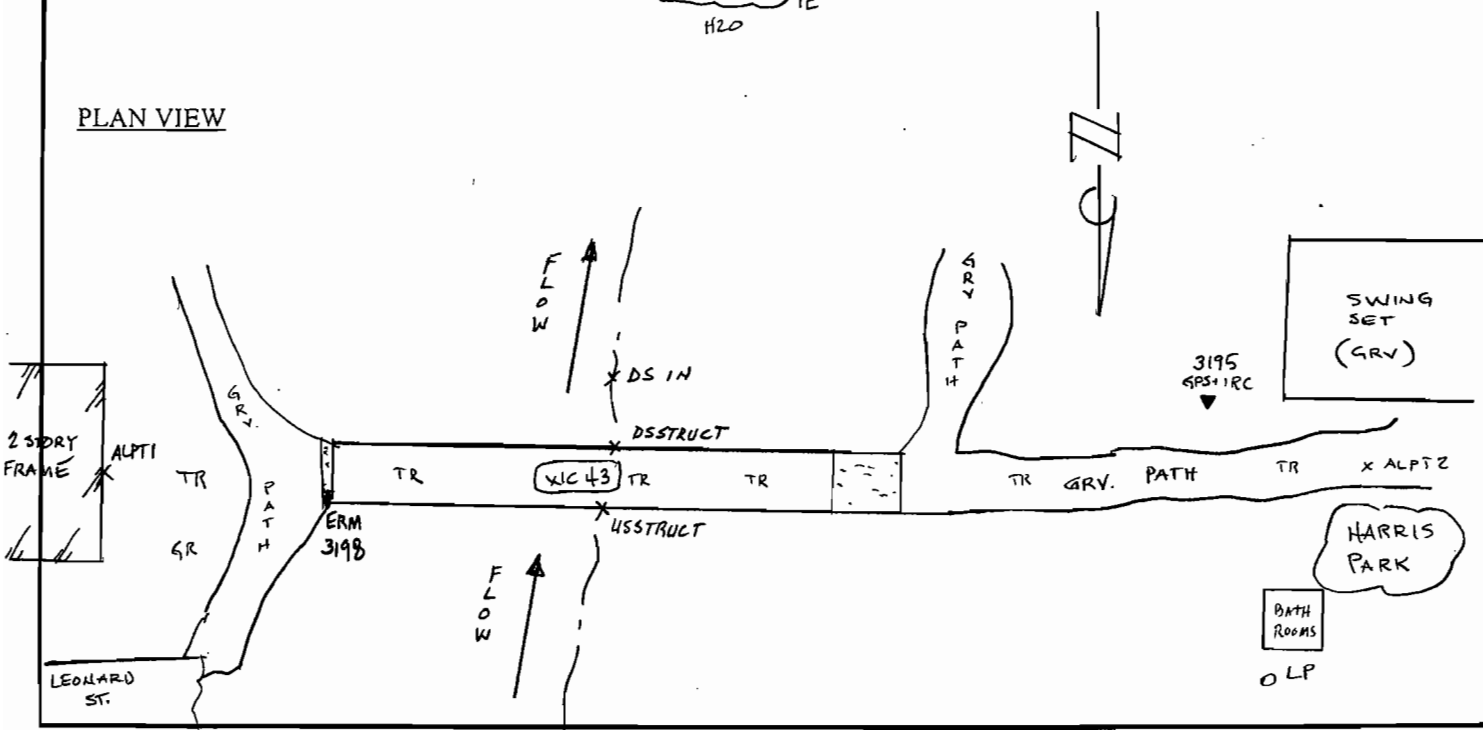
ERM DESCRIPTION: "□" CUT ON US LEFT TOP DECK @ ABUTMENT

ADDL COMMENTS 3195 - 3238

PROFILE VIEW



PLAN VIEW



Ā @ 3195 5.42 3197 CHK+3196 ⟨ERR 0.02 0.05⟩

BS@ 3196 5.16 3238 CHK+3196 ⟨ERR 0.03 0.06⟩

▲ 3196

BALL FIELD

CFN BACKSTOP

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC44 PED BR.

STREAM NAME: WALLER CREEK DATE: 11-12-07

LOCATION: SPARKS CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3242

BRIDGE RAIL 7.2 DECK 0.3 WIDTH 5.0 PIER(s) 1 @ 1.5 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

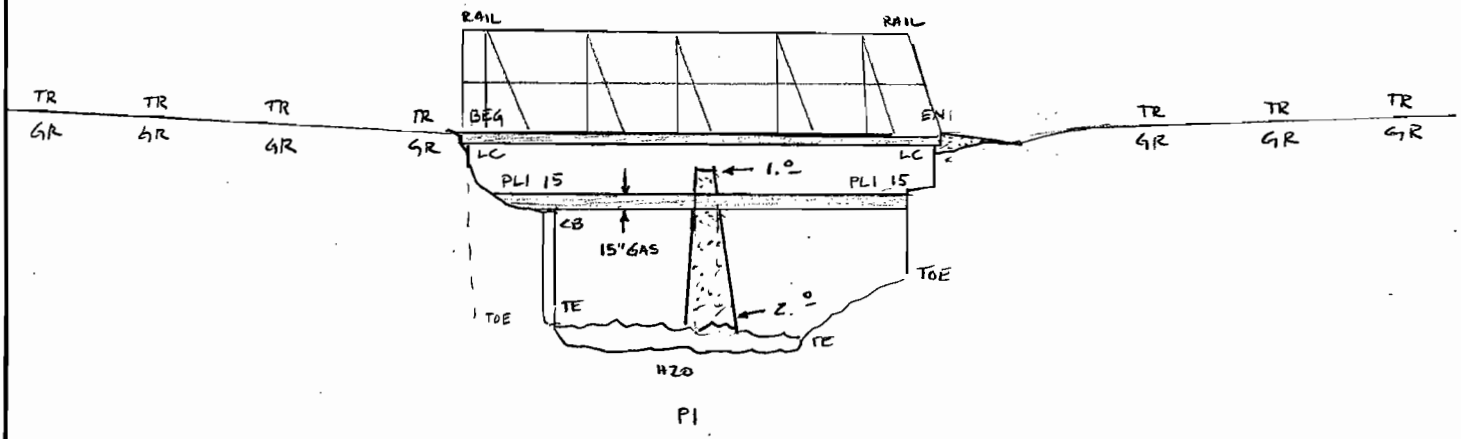
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

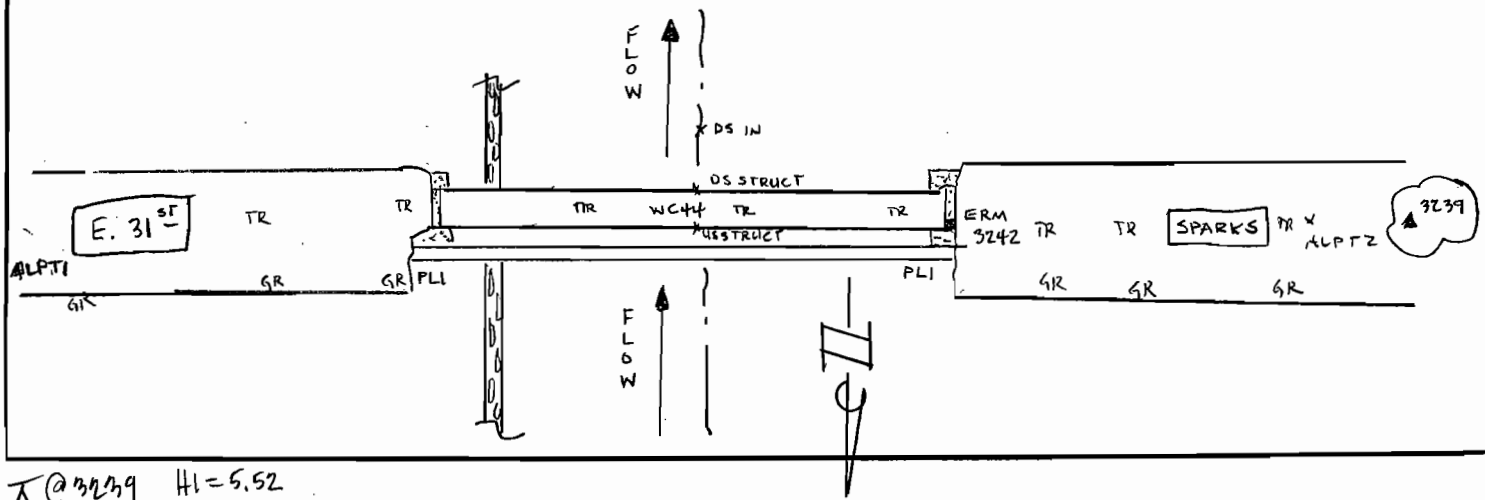
ERM DESCRIPTION: 4" CUT ON US RIGHT TOP DECK @ ABUTMENT

ADDL COMMENTS 3239-3287

PROFILE VIEW



PLAN VIEW



T @ 3239 HI = 5.52

BS 3240 HI = 5.35

3241 CHK + 3240 ⟨ERR 0.12 / 0.05⟩

3287 CHK + 3240 ⟨ERR 0.12 / 0.05⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC45 1 OF 2

STREAM NAME: Waller Creek DATE: 11-27-07

LOCATION: E. 32ND St. CREW Moseley Combs

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3488

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

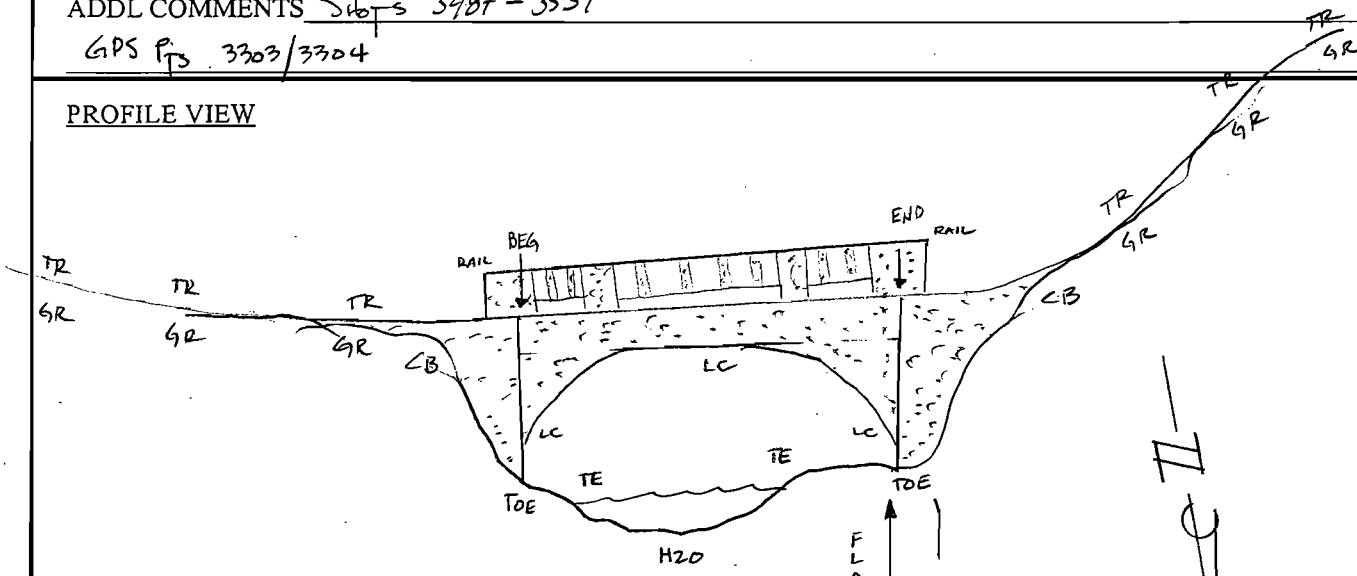
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON DS RIGHT CRB @ END BRIDGE

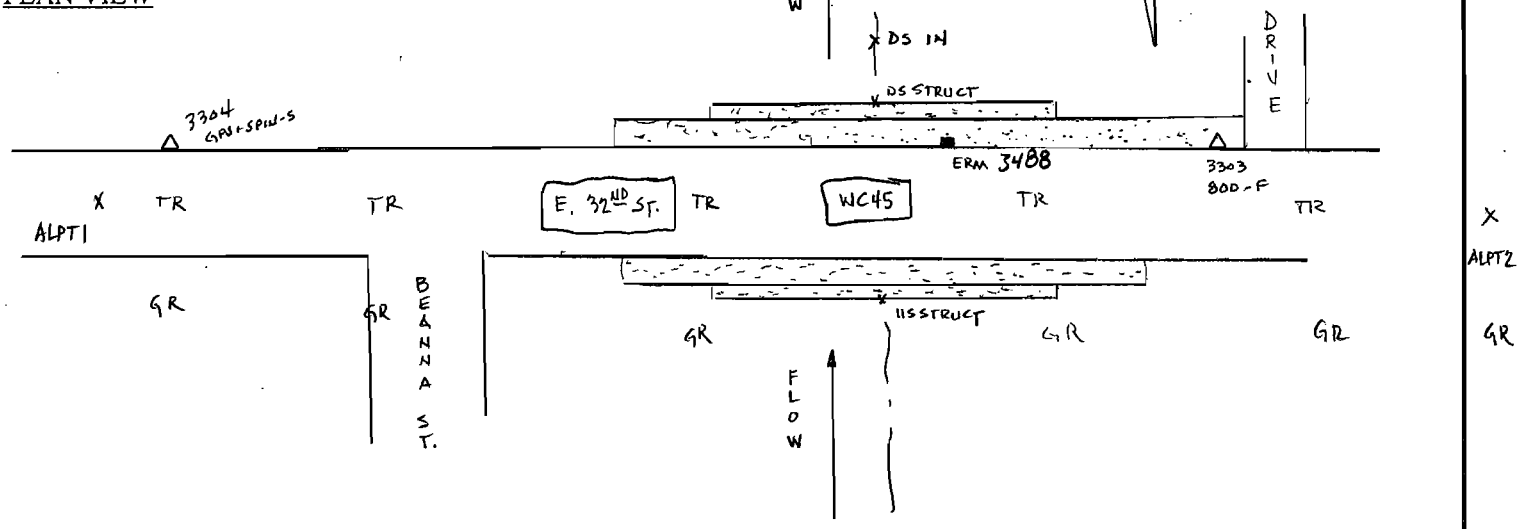
ADDL COMMENTS Shots 3487 - 3531

GPS Pts 3303/3304

PROFILE VIEW



PLAN VIEW



T @ 3303 BS 3304

HI = 5.35 HT = 5.40

3487 5.40 CHK + 3304 <ERR 0.07 0.08>

3531 5.40 CHK + 3304 <ERR 0.08 0.08>

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 46 BR (GOM Coord)

STREAM NAME: Waller Creek DATE: 11-30-07

LOCATION: Landon Ln. CREW Moseley Gomes Tramontana

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3533

BRIDGE RAIL 3.10 DECK 0.9 WIDTH 4.0 PIER(s) 2 @ 0.6 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H:____ W:____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US:____ DS:____

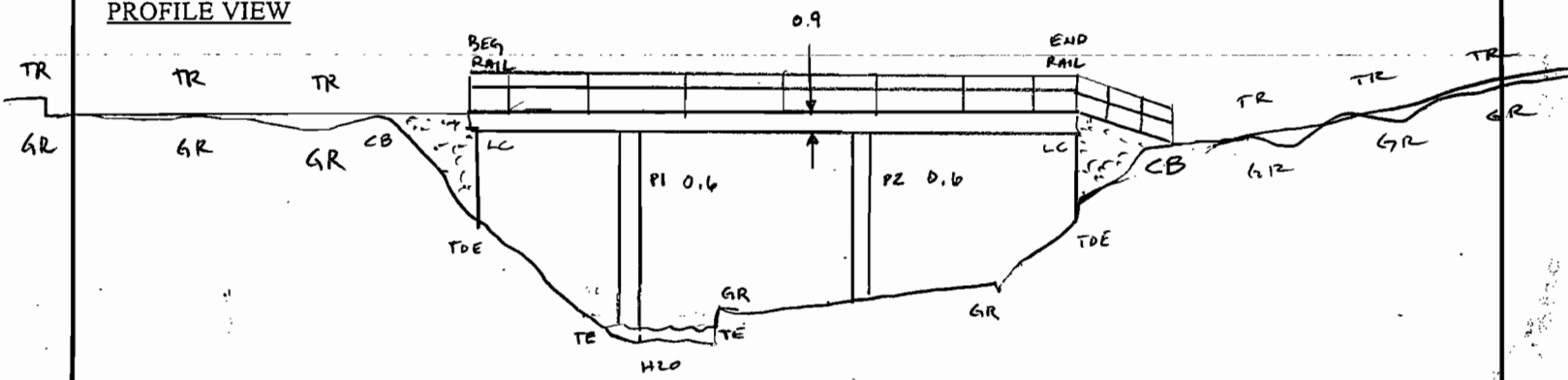
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: "J" cut on US right top abut @ end BR #3533

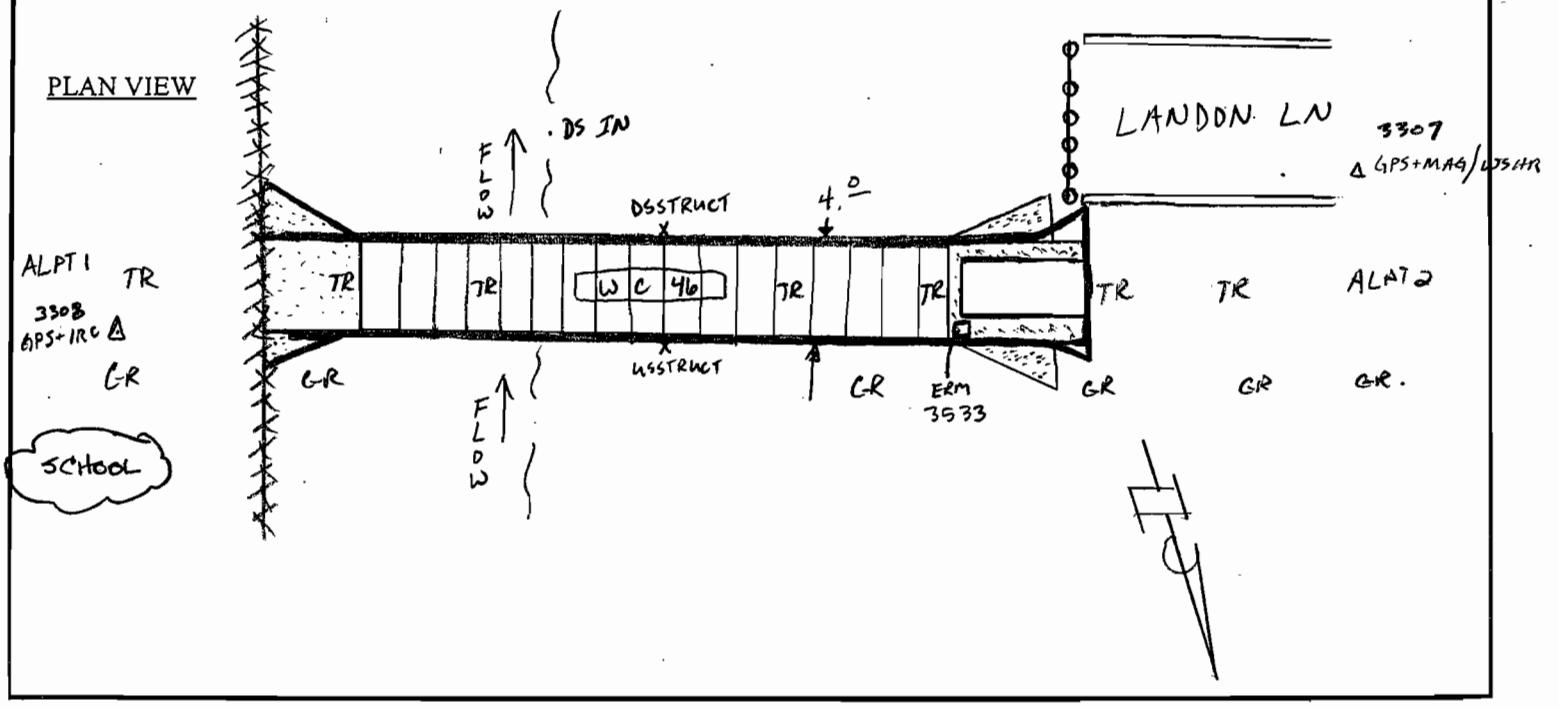
ADDL COMMENTS ~~Shots~~ 3532 - 3584

GPS Pts 3307/3308

PROFILE VIEW



PLAN VIEW



T @ 3307 BS 3308

5.33 4.77

3572 4.77 CHK T 3308 ⟨ERR. 0.01 0.00⟩

3571 4.77 CHK T 3308 ⟨ERR. ⟩

T @ 3308 BS 3307

HI = 5.07 HT = 5.19

3572 - 5.19 CHK T 3307 ⟨ERR. 0.01 0.06⟩

3584 5.19 CHK T 3307 ⟨ERR 0.01 0.05⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 47

STREAM NAME: Waller Creek DATE: 11-27-07

LOCATION: Harris Ave CREW Moseley Combs Thomason

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3312

BRIDGE RAIL 4" DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

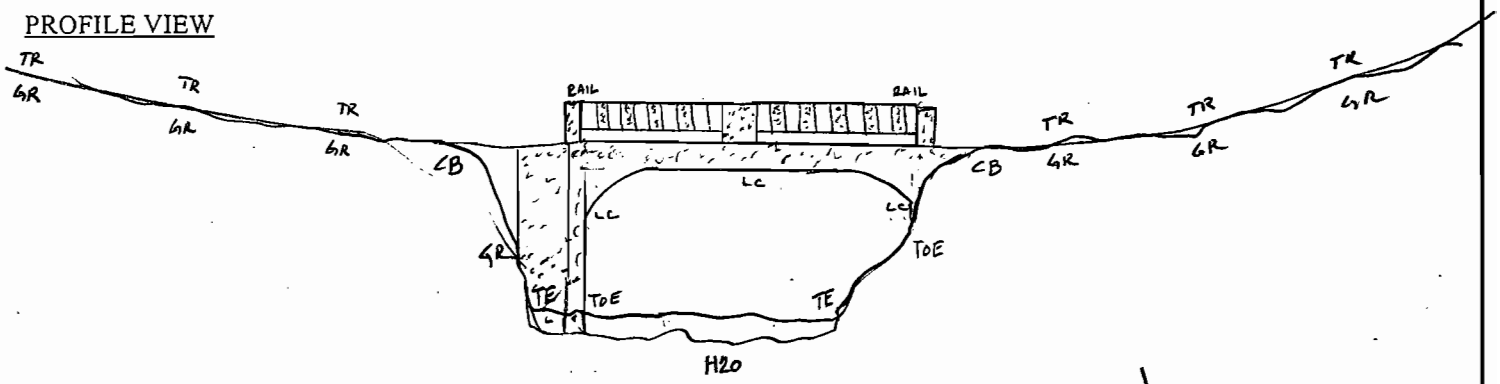
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" CUT ON US CENTER BACK OF CRB # 3312

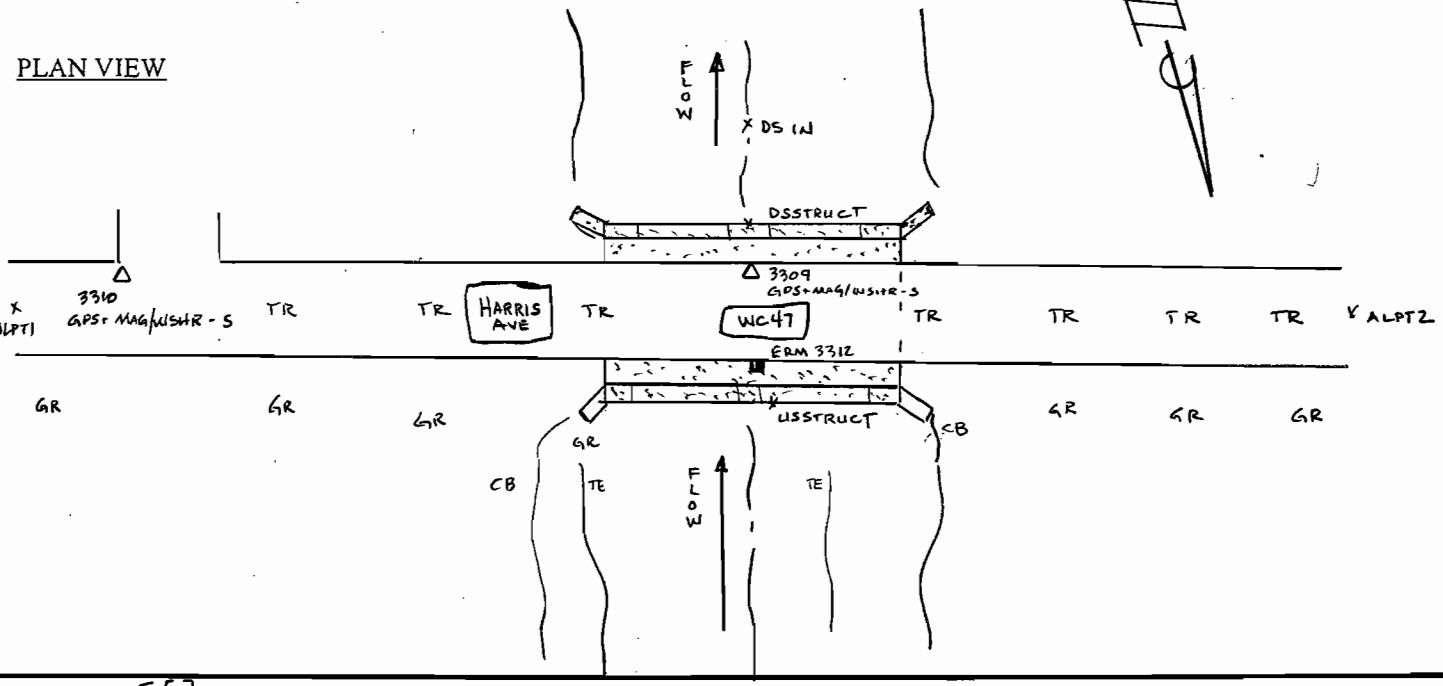
ADDL COMMENTS Shots 3312 - 3355

GPS Pts 3309 / 3310

PROFILE VIEW



PLAN VIEW



TA@ 3309	5.57				
BS 3310	5.70	00-00-00	180-00-21	193.84	
3311	5.70	CHK + 3310	ERR 0.04 / 0.01		
3312	5.80	ERM BR WC47			
3355	5.70	CHK + 3310	ERR 0.02 / 0.00		

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC48 BR

STREAM NAME: Waller Creek DATE: 12-03-07

LOCATION: E 38TH St. CREW Moseley Joe Q. Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3709

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) ____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

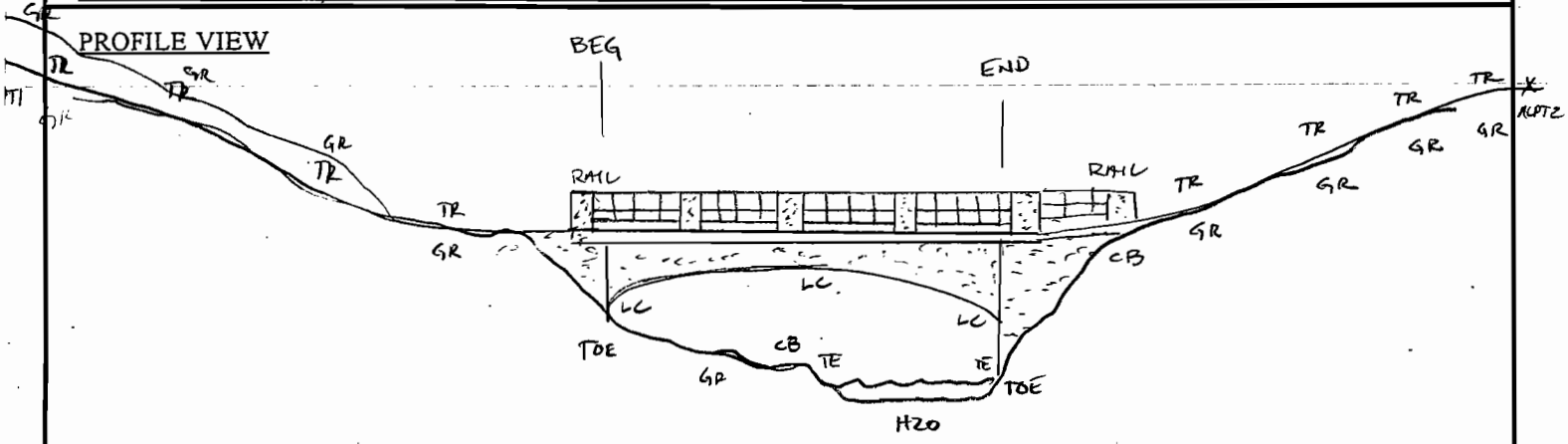
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: USGS Brass Disc FND on US Right Top Deck @ Abut

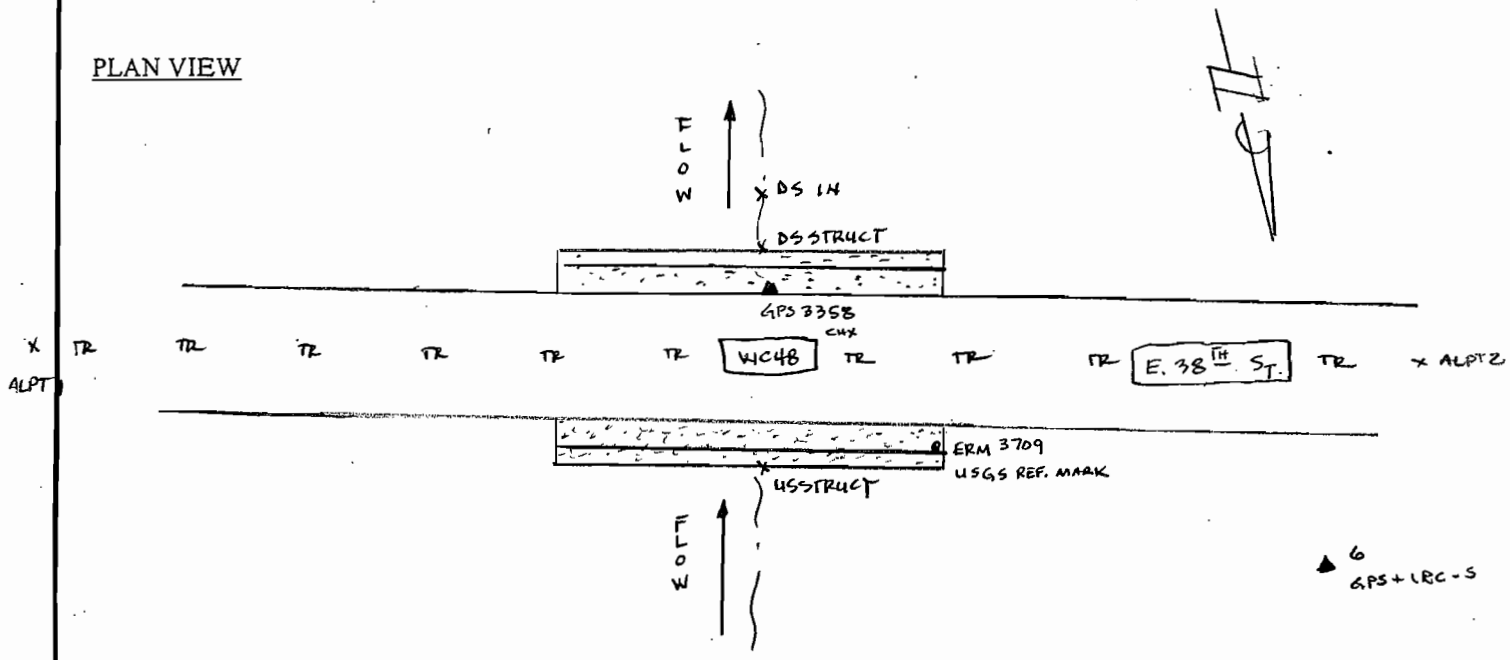
ADDL COMMENTS Shots 3708 - 3752

GPS Pts 3358, 6

PROFILE VIEW



PLAN VIEW



T@3358 BS 6

HI = 5.46 HT = 5.30

3708 5.30 CHK+6 ⟨ERR 0.04 / 0.04⟩

3752 5.30 CHK+6 ⟨ERR 0.04 / 0.04⟩

1 of 2 GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME CUL WC49

STREAM NAME: WALLER CREEK DATE: 11-30-07

LOCATION: 1ST GOLF CART CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3586

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

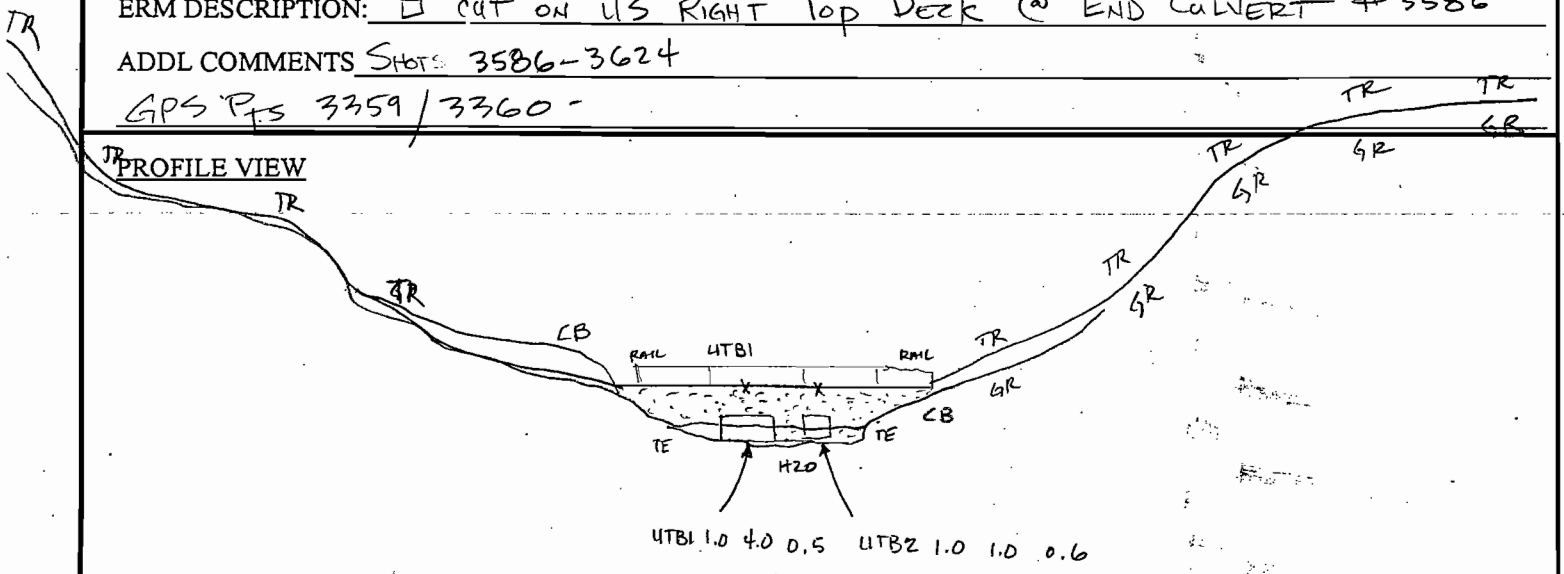
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US RIGHT TOP DECK @ END CULVERT #3586

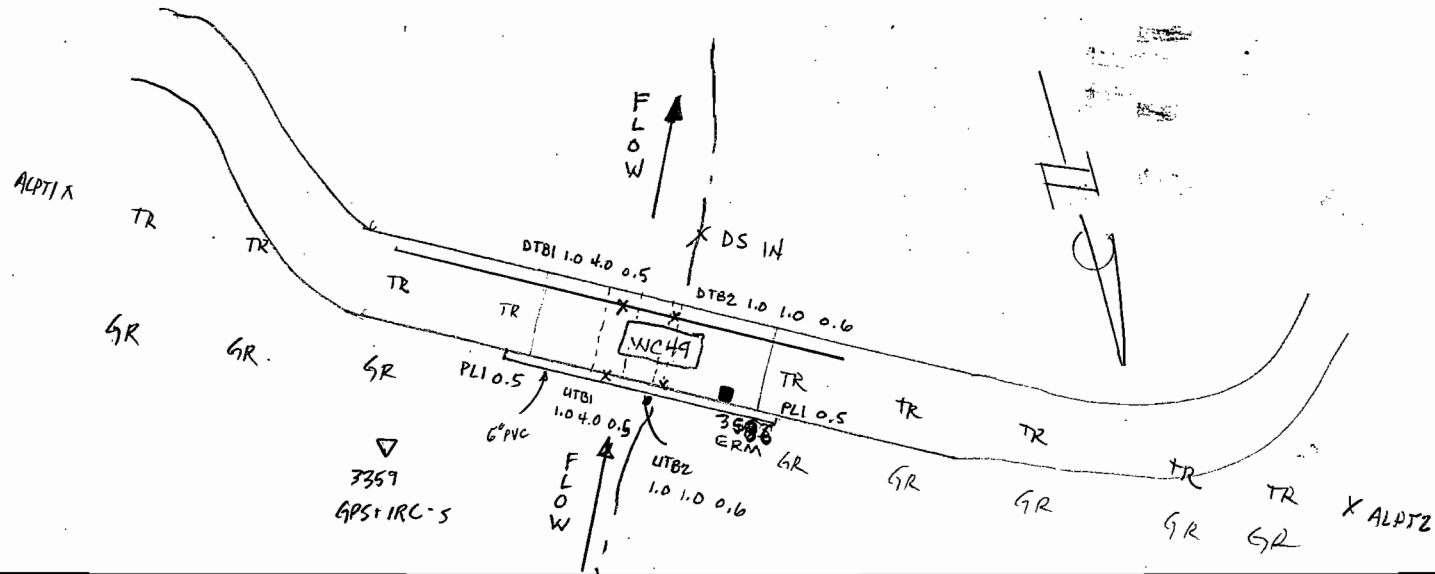
ADDL COMMENTS SHOTS 3586-3624

GPS PTS 3359 / 3360 -

PROFILE VIEW



PLAN VIEW



T@ 3359 BS 3360

HI = 5.30 HT = 5.21

3585 5.21 CHK + 3360 ⟨ERR. 0.14 / 0.02⟩

3586 @ ERM

3624 5.21 CHK+3360 ⟨ERR. .14 / .02⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 50 PL

STREAM NAME: Waller Creek DATE: 11-29-07

LOCATION: 3RD Structure DS of E. 41ST St. on Golf Course CREW Moseley Combs

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3458

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

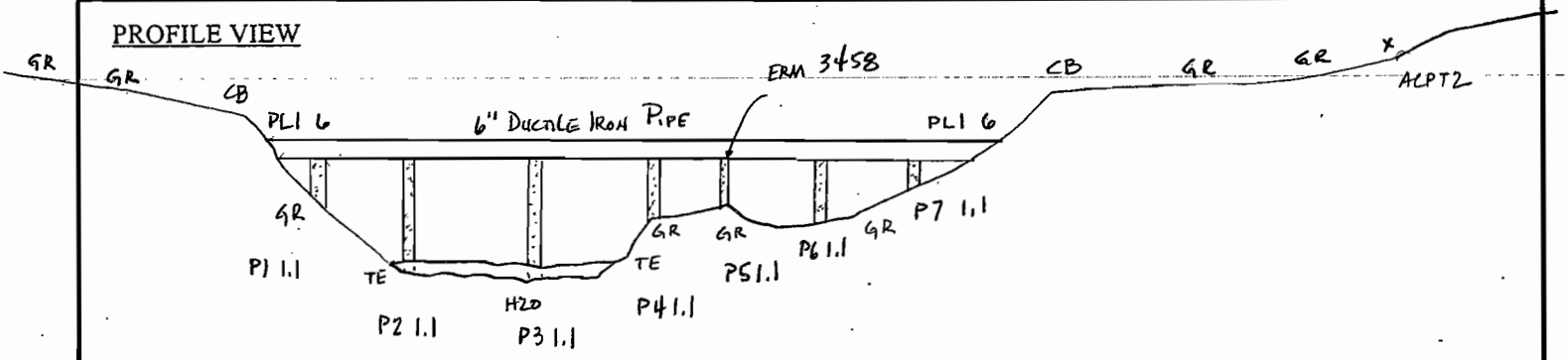
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

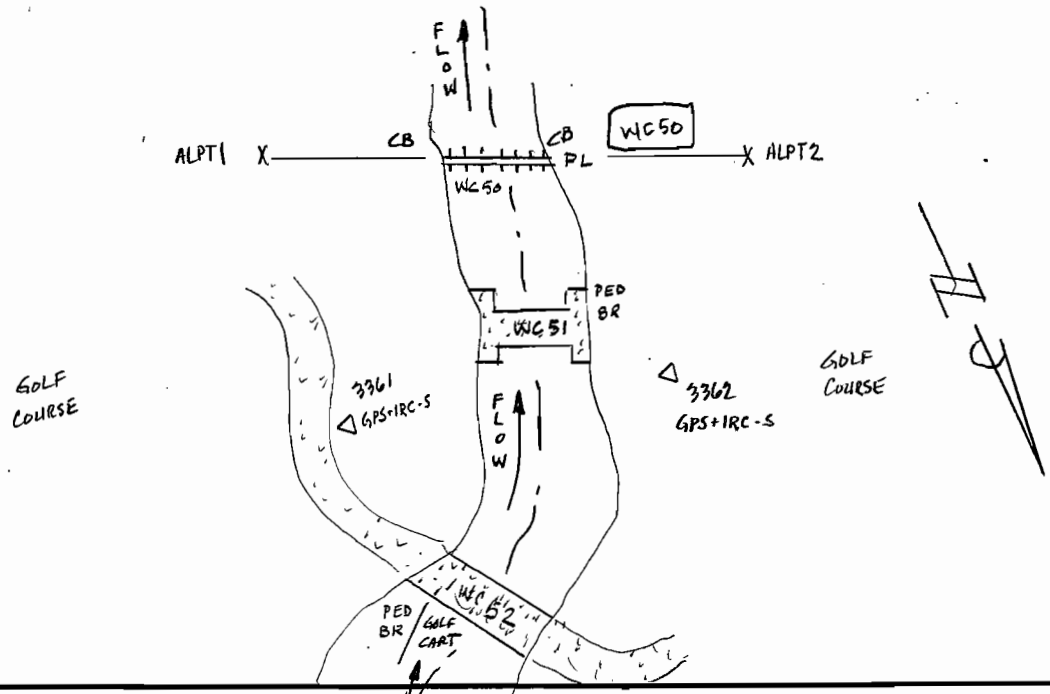
ERM DESCRIPTION: "□" Cut on Top PS # 3458

ADDL COMMENTS SHOTS 3456 – 3485

PROFILE VIEW



PLAN VIEW



Δ@ 3362 BS 3361

HI 5.49 HT 4.93

3457 CHK + 3361 ⟨ERR 0.10 0.03⟩

3486 CHK + 3361 ⟨ERR 0.10 0.03⟩

Loop

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 51 BR

STREAM NAME: Waller Creek DATE: 11-29-07

LOCATION: Hancock Golf Course CREW Moseley Combs

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3366

BRIDGE RAIL 0.5 DECK _____ WIDTH _____ PIER(s) 2 @ 1.6 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

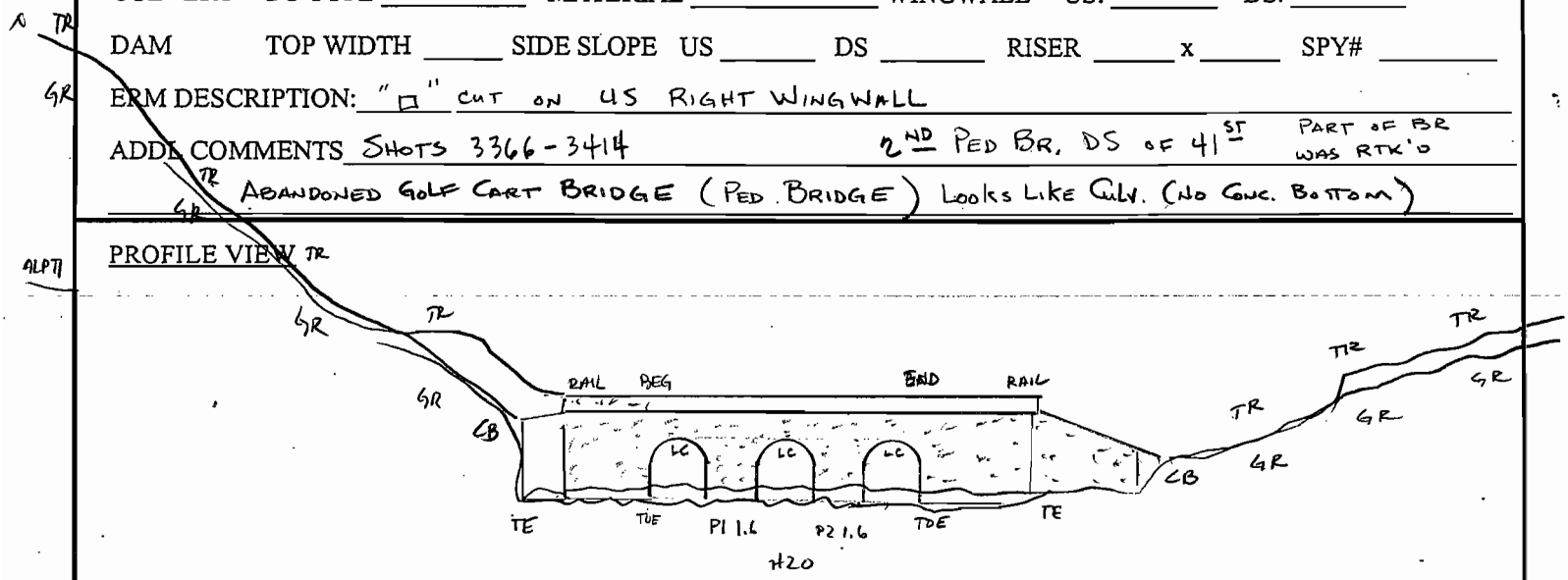
DAM TOP WIDTH ____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" cut on US Right Wingwall

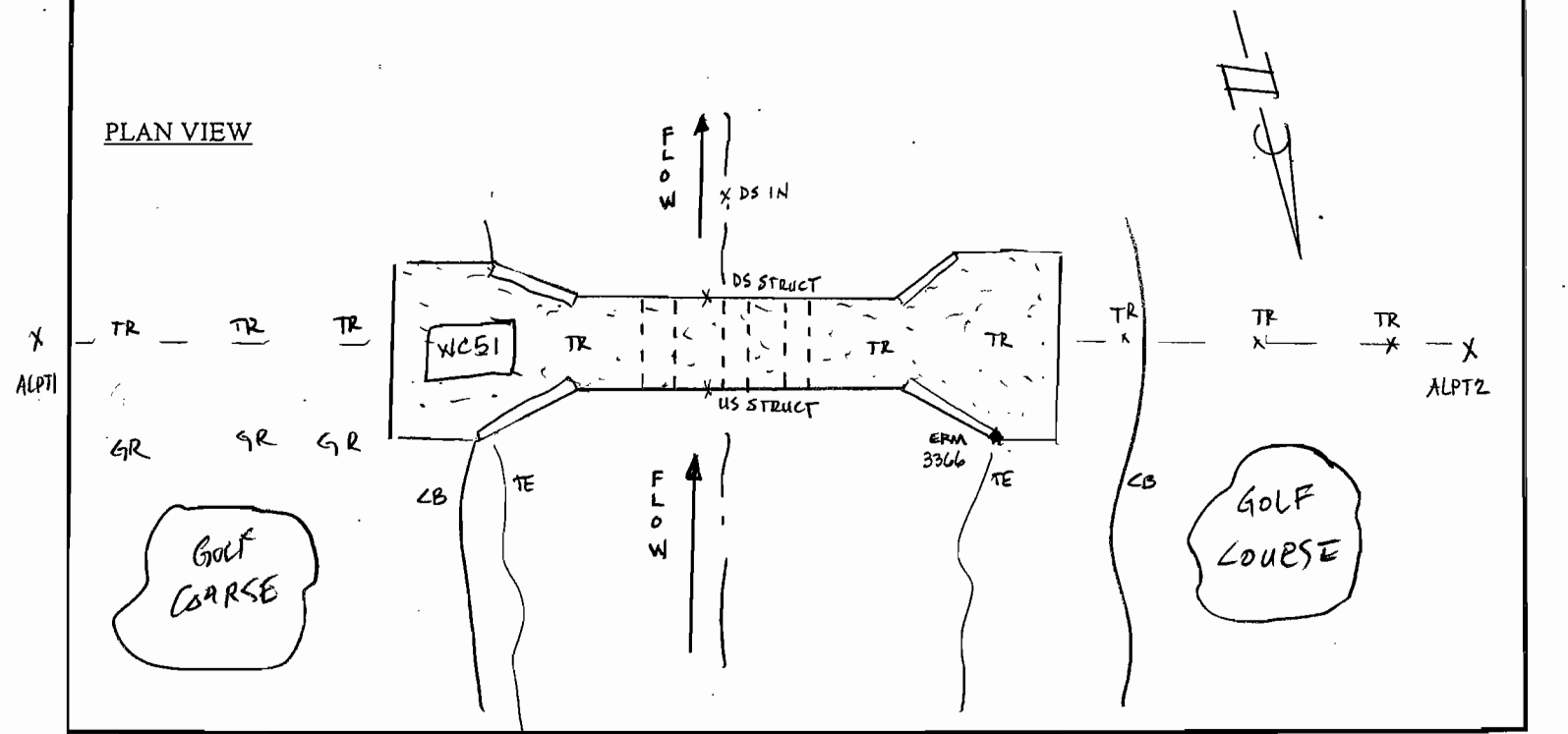
ADDL COMMENTS Shots 3366-3414 2ND Ped Br, DS of 41ST Part of BR was RTK'd

Abandoned Golf Cart Bridge (Ped Bridge) Looks like Culv. (No Conc. Bottom)

PROFILE VIEW



PLAN VIEW



T@3362 BS 3361

HI = 5.49 HT = 4.93

3398 4.93 CHK 3361 <ERR .13 .03>

3414 " " <ERR .11 .03>

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 52 BR

STREAM NAME: WALLER CREEK DATE: 11-29-07

LOCATION: 1ST STRUCTURE DS OF E. 41ST ON GOLF COURSE CREW MOSELEY COMBS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3415

BRIDGE RAIL 0.4 DECK _____ WIDTH _____ PIER(s) 1 @ 1.6 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

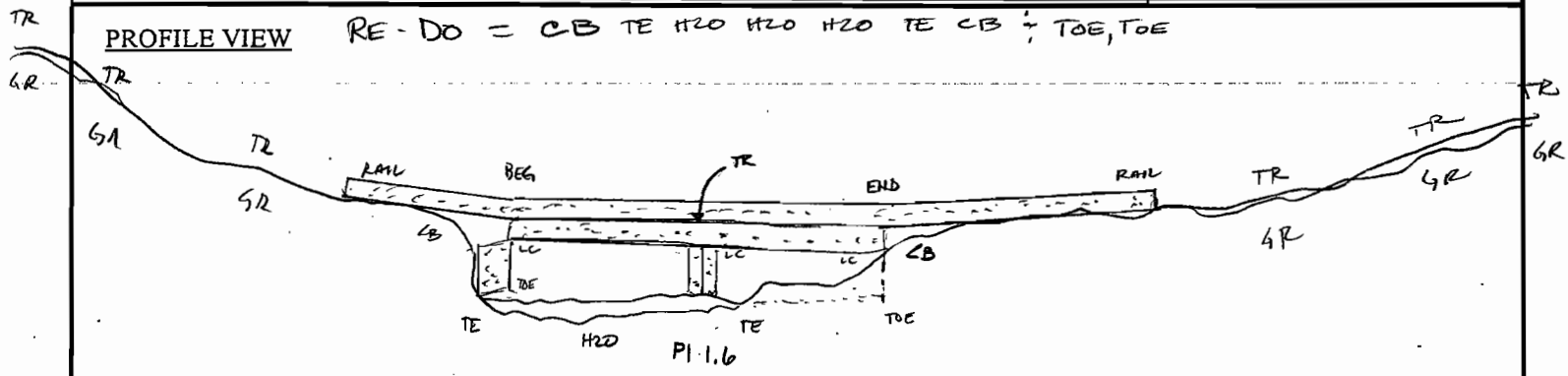
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US RIGHT TOP RAIL @ ABUTMENT # 3415

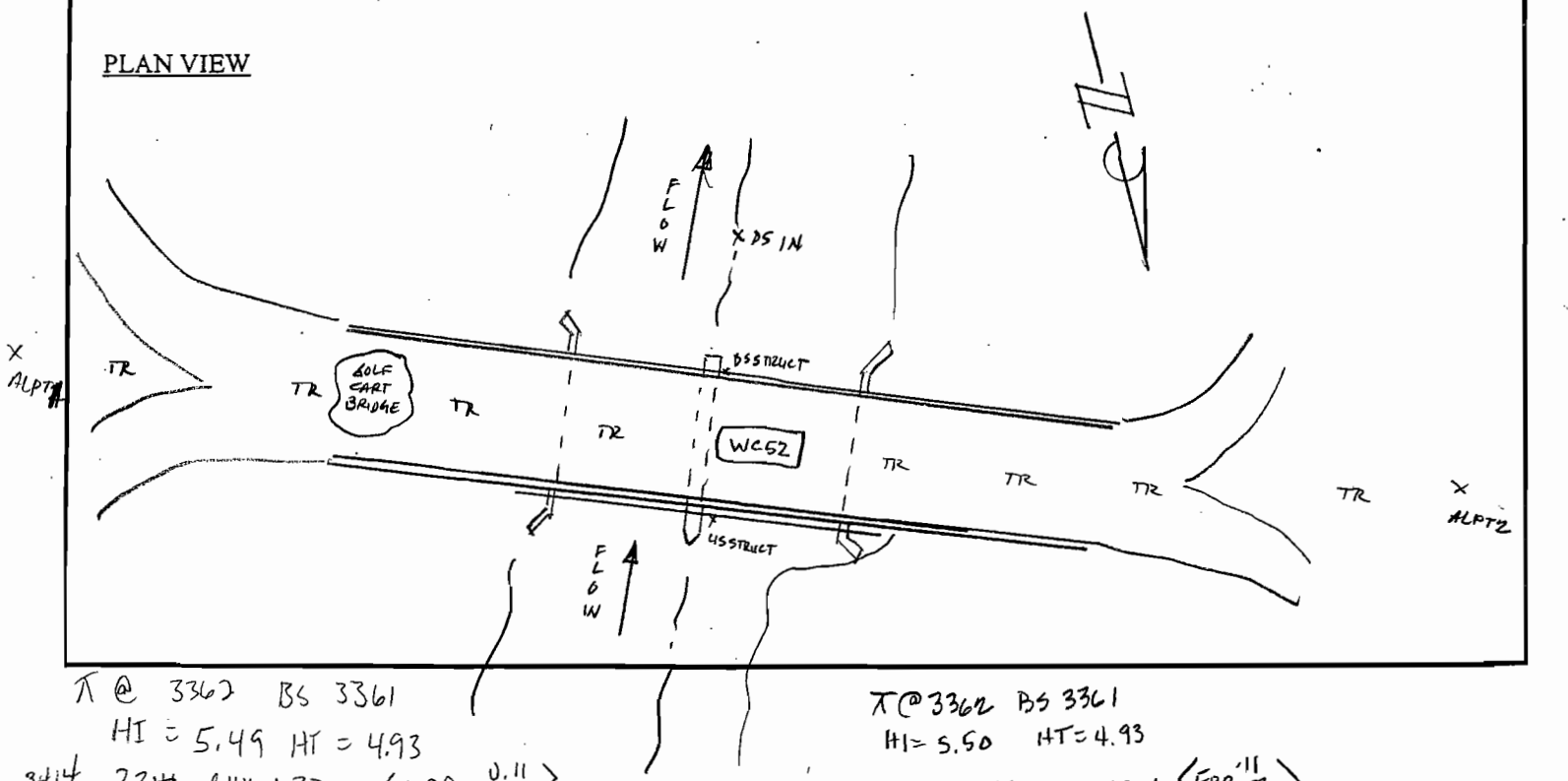
ADDL COMMENTS SHOTS 3415 – 3456

RE-DO X-SECTION ON 12-20-07 SHOTS 4940 – 4951

PROFILE VIEW RE-DO = CB TE H2O H2O H2O TE CB + TOE, TOE



PLAN VIEW



T @ 3362 BS 3361
HI = 5.49 HT = 4.93
3414 ~~3414~~ CHK + 3361 ⟨ERR 0.11 0.03⟩
3457 CHK + 3361 ⟨ERR 0.10 0.03⟩

T@3362 BS 3361
HI = 5.50 HT = 4.93
4940 4.93 CHK+3361 ⟨ERR .11 .02⟩
4941 5.80 CHK+3415 ERM
4951 4.93 CHK+3361 ⟨ERR .11 .03⟩

600P

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 53

STREAM NAME: Waller Creek DATE: 12-03-07

LOCATION: E. 41st St. CREW Moseley Joe Q. Edwards

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3664

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) — @ — PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

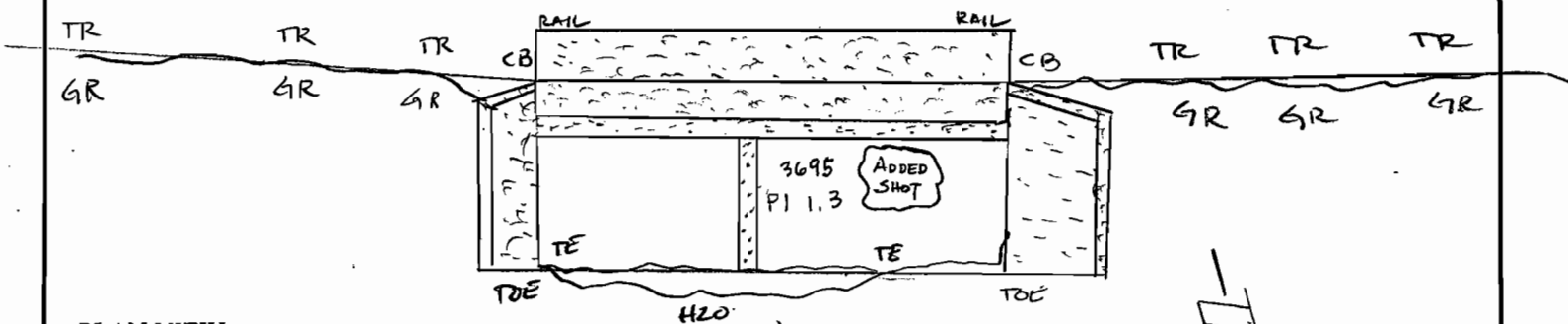
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

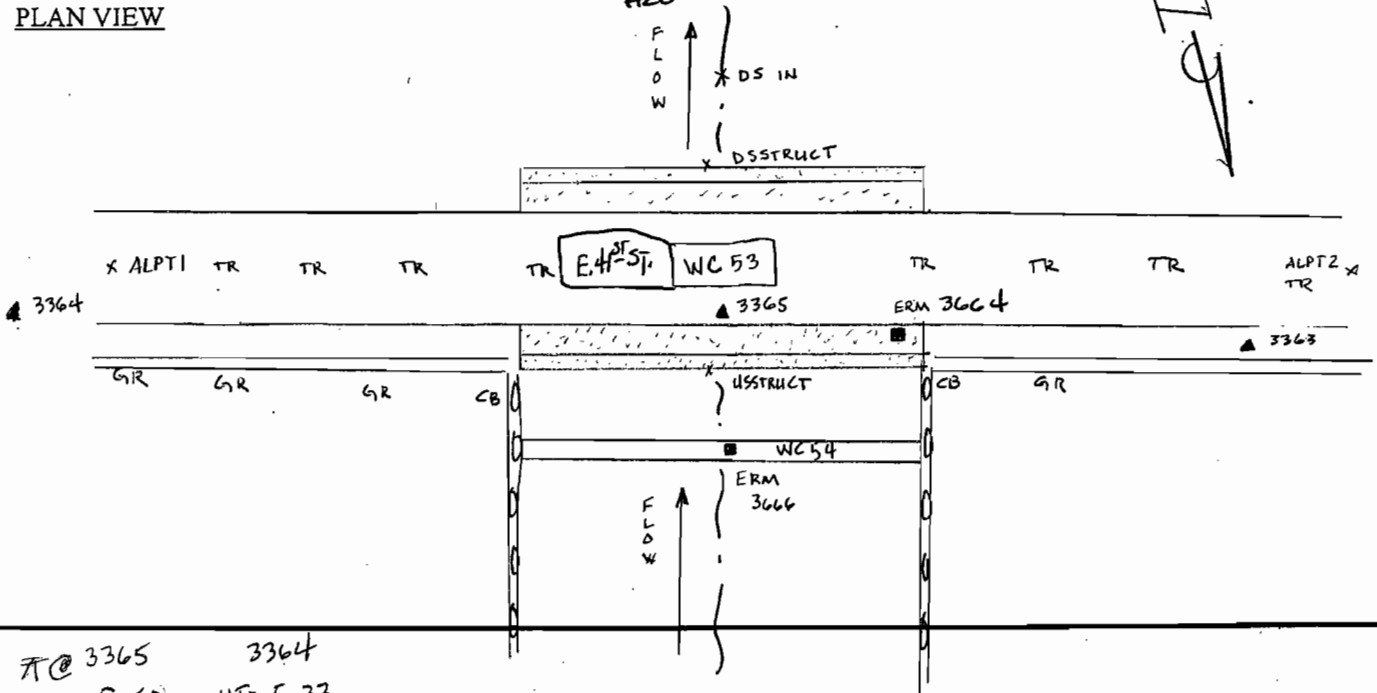
ERM DESCRIPTION: "H" cut on US Right Top Deck

ADDL COMMENTS Shots 3625 - 3665 Add Shot 3695 to WC 53

PROFILE VIEW



PLAN VIEW



AT@ 3365 3364

HI = 5.50 HT = 5.33

3625 5.33 CHK = 3364 < ERR. 0.02 0.08 >

3665 5.33 CHK = 3364 < ERR. 0.04 0.07 >

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC54 CuL

STREAM NAME: Waller Creek DATE: 12-03-07

LOCATION: +/- 10' US of WC53 (E. 41ST St.) CREW Moseley Joe Q. Edwards

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3666

BRIDGE RAIL — DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE RD LENGTH _____ SIZE H: 2.0 W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: — DS: —

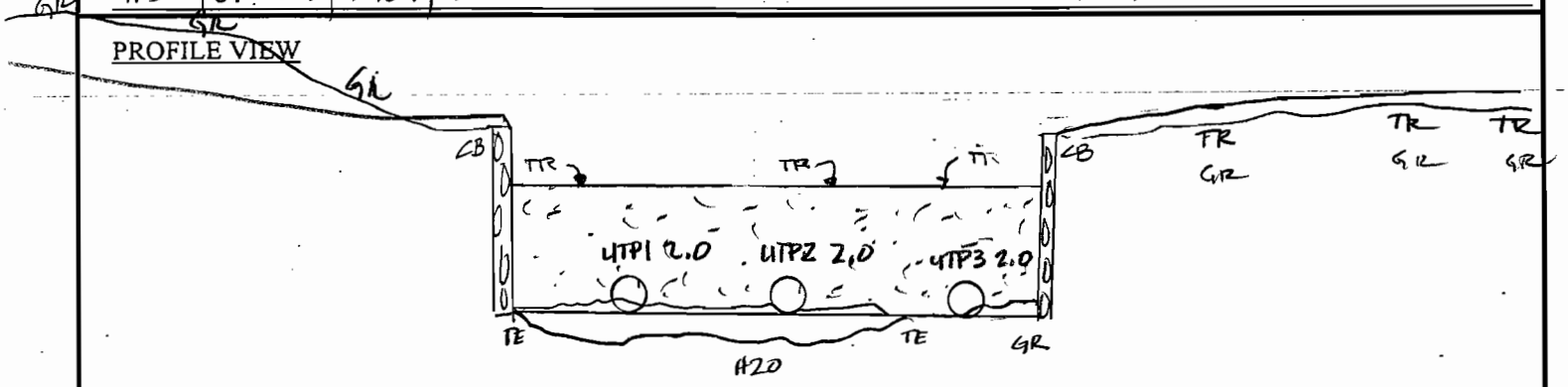
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US CENTER TOP SPILLWAY / DAM

ADDL COMMENTS SHOTS 3666-3707 STRUCTURE (CUL) +/- 10' US OF WC53

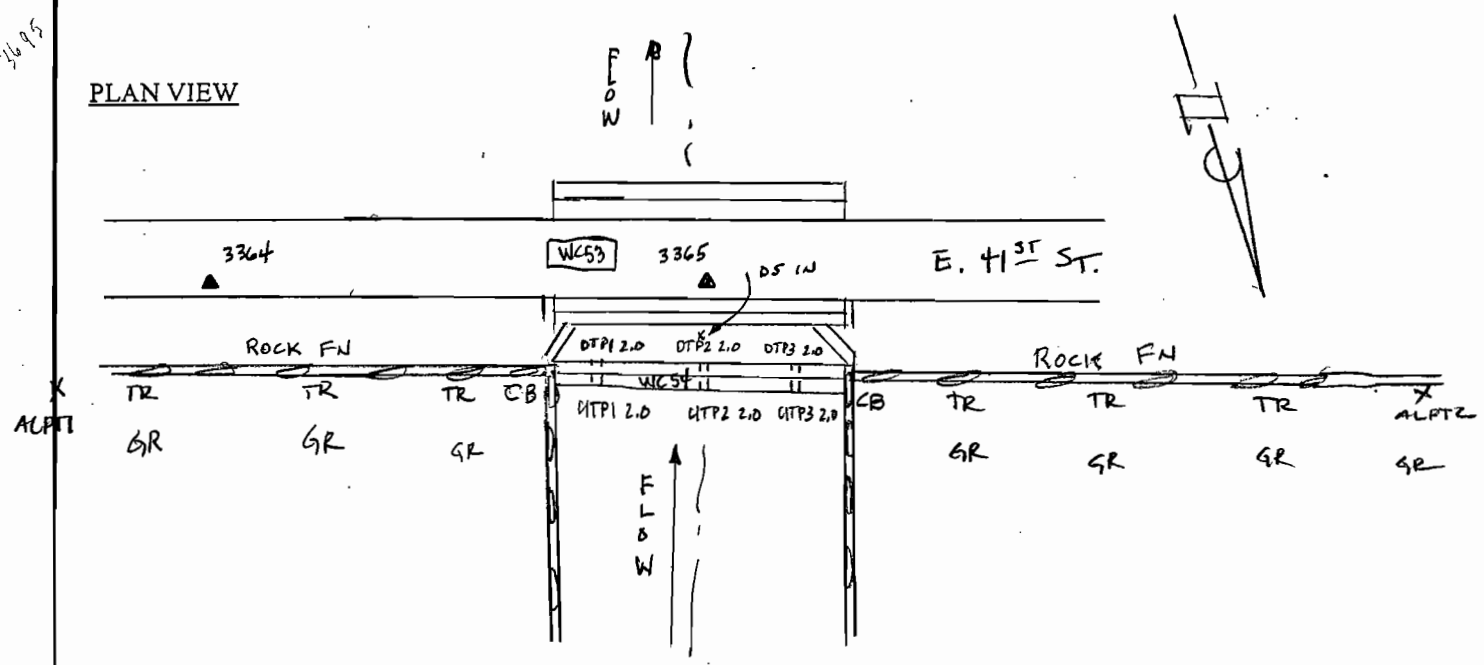
GPS Pts. 3363, 3364, 3365 NOTE SHOT 3695 ADD TO WC53 DELETE FROM WC54

PROFILE VIEW



3695

PLAN VIEW



T@ 3365 BS 3364
HI = 5.50 HT = 5.33

3666 5.8 ERM
3696 5.33 CHK + 3364 ⟨ERR. 0.04 / 0.07⟩

T@ 3364 BS 3365
HI = 5.46 HT = 5.37

3697 - 5.37 CHK + 3365 ⟨ERR. 0.02 / 0.09⟩
3707 5.37 CHK + 3365 ⟨ERR. 0.029 / 0.087⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME BR WC55

STREAM NAME: WALLER CREEK DATE: 12-04-07

LOCATION: +/- 200' US OF E. 41ST @ GRIFFEN SCHOOL CREW MOSELEY COMBS THOMASON

TYPE BR (V) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3762

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

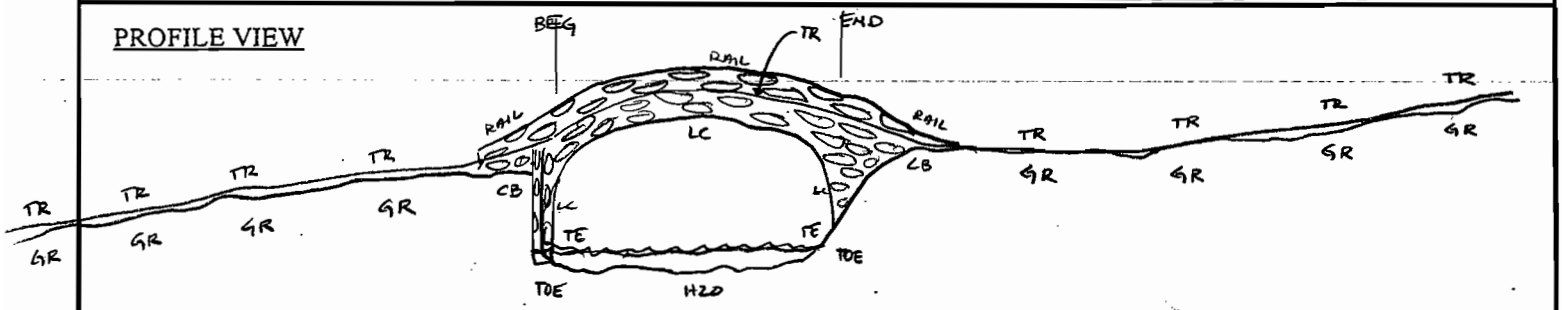
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON DS LEFT TOP RAIL

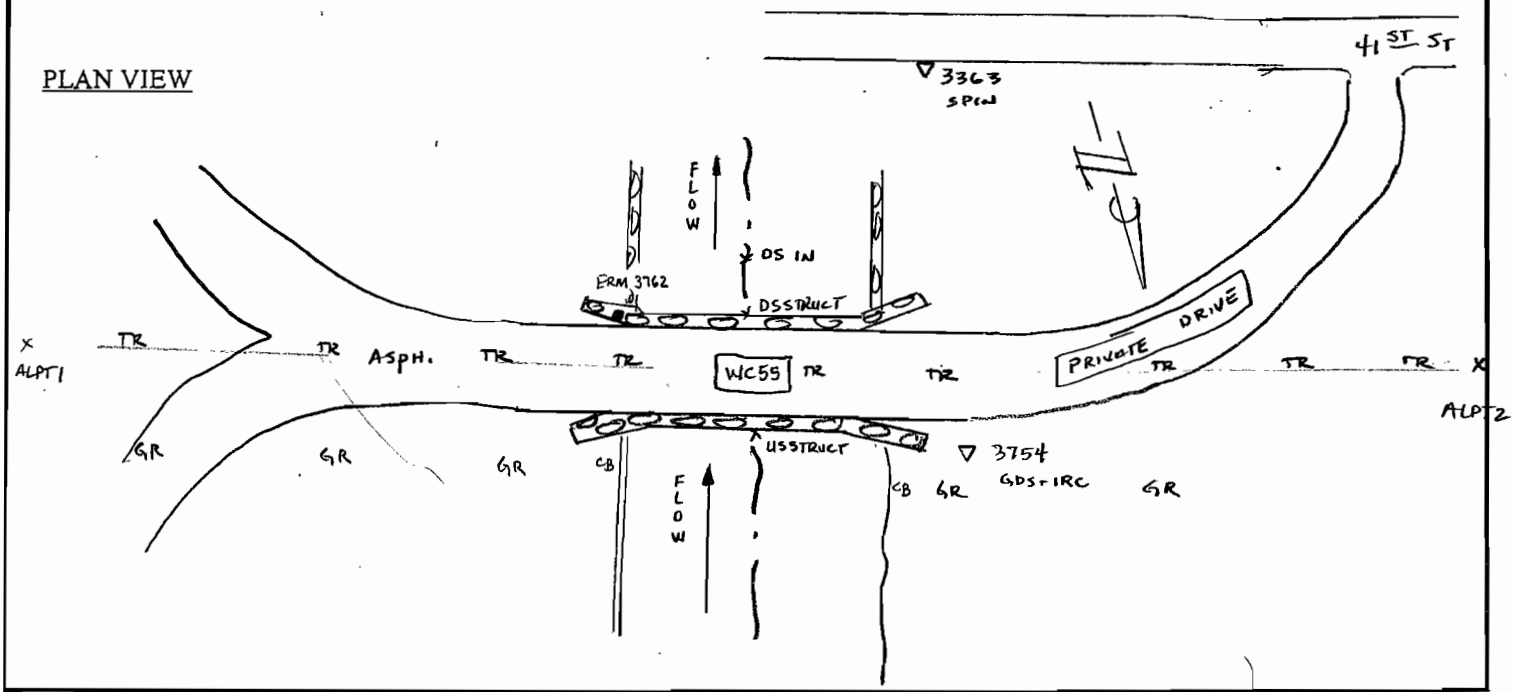
ADDL COMMENTS SHOTS 3761 - 3805

GPS PTS 3363/3754 PRIVATE DRIVE @ GRIFFEN SCHOOL

PROFILE VIEW



PLAN VIEW



T @ 3754 BS 3363

HI = 5.30 HT = 5.43

3761 5.43 CHK +3363 ⟨ERR 0.06 / 0.06⟩

3805 5.43 CHK +3363 ⟨ERR 0.08 / 0.09⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME BR WC 56

STREAM NAME: Waller Creek DATE: 12-04-07

LOCATION: Park Blvd CREW Moseley Combs Thomason

TYPE BR (Y) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3807

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 2 @ 1.2 PIER SHAPE SQ

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

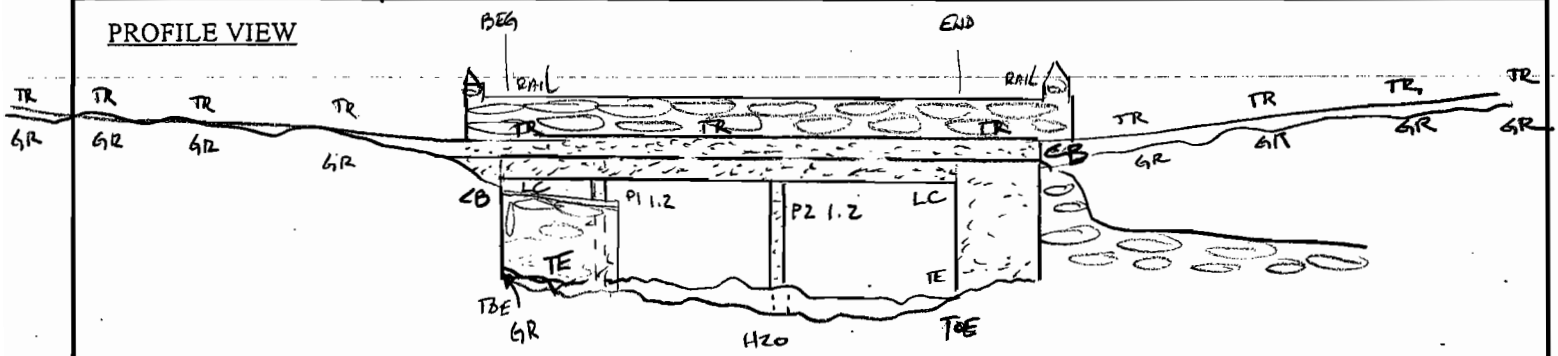
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "Δ" End Cut on US Left Top Grb @ Beg Br #3807

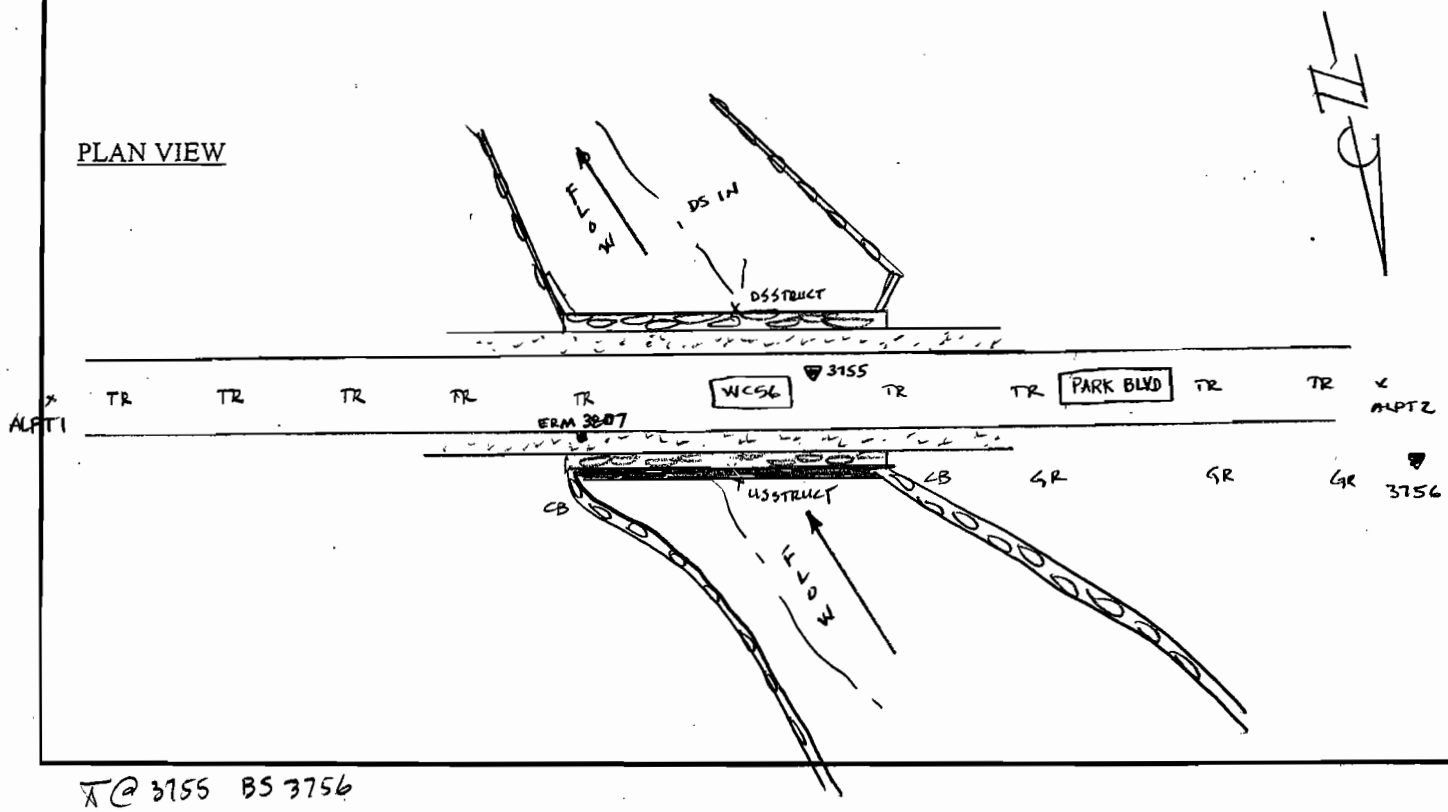
ADDL COMMENTS Shots 3806 - 3851

GPS Pts 3755/3756

PROFILE VIEW



PLAN VIEW



T @ 3755 BS 3756

HI = 5.54 HT = 5.10

3806 5.10 CHK + 3756 ⟨ERR 0.01 / 0.02⟩

3807 ERM BR WC 56

3851 5.10 CHK + 3756 ⟨ERR 0.01 / 0.02⟩

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC57 PL

STREAM NAME: WALLER CREEK DATE: 12-04-07

LOCATION: E. 43RD ST. CREW MOSELEY COMBS THOMASON

TYPE PL BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3853

BRIDGE RAIL — DECK — WIDTH ⌒ PIER(s) _____ @ _____ PIER SHAPE SQ

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

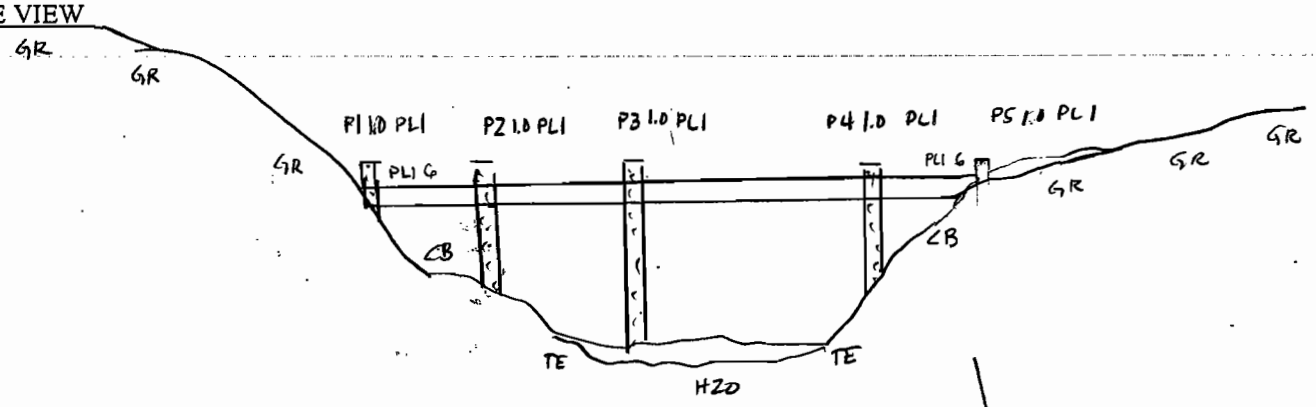
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON TOP P5

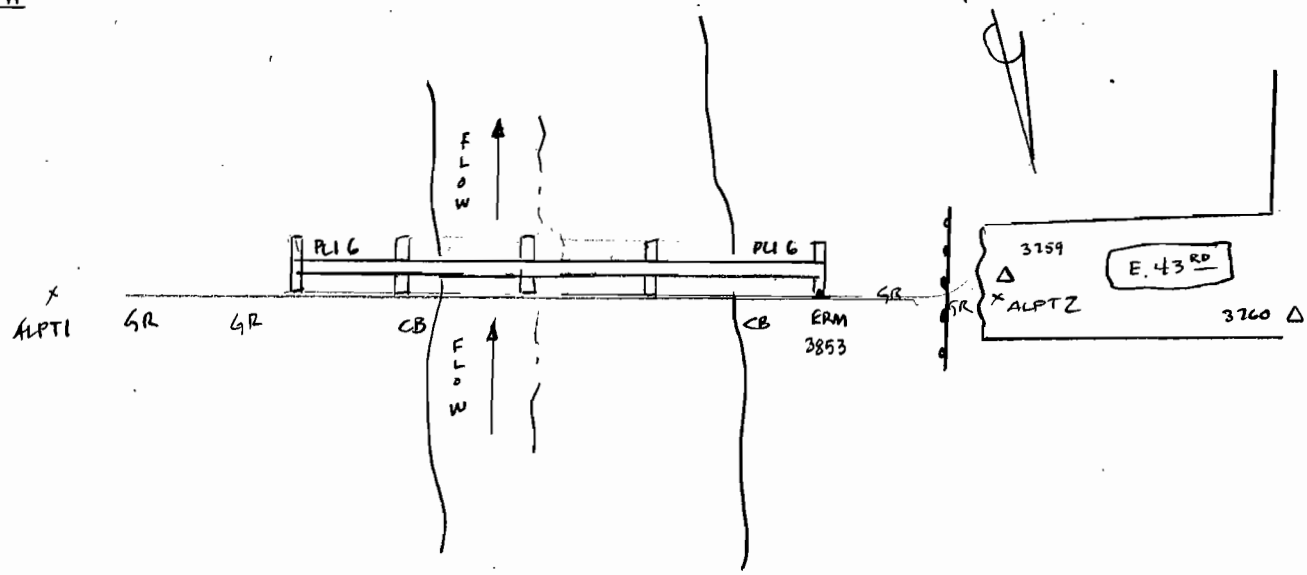
ADDL COMMENTS SHOTS 3852 - 3876 GAS PIPELINE XING

GPS PTS 3759/3760

PROFILE VIEW



PLAN VIEW



T @ 3759 BS 3760

HT = 5.45 HI = 5.25

3852 5.25 CHK = 3760 ⟨ERR. 0.03 / 0.06⟩

3876 5.25 CHK = 3760 ⟨ERR. 0.03 / 0.05⟩

Good

150
XC.25
380
37.50

PROJECT: Waller Creek Flood Study STRUCTURE NAME BR WC59

STREAM NAME: Waller Creek DATE: 12-05-07

LOCATION: Duval St. +/- 200' S. of 45th CREW Moseley Brooks

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 3933

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

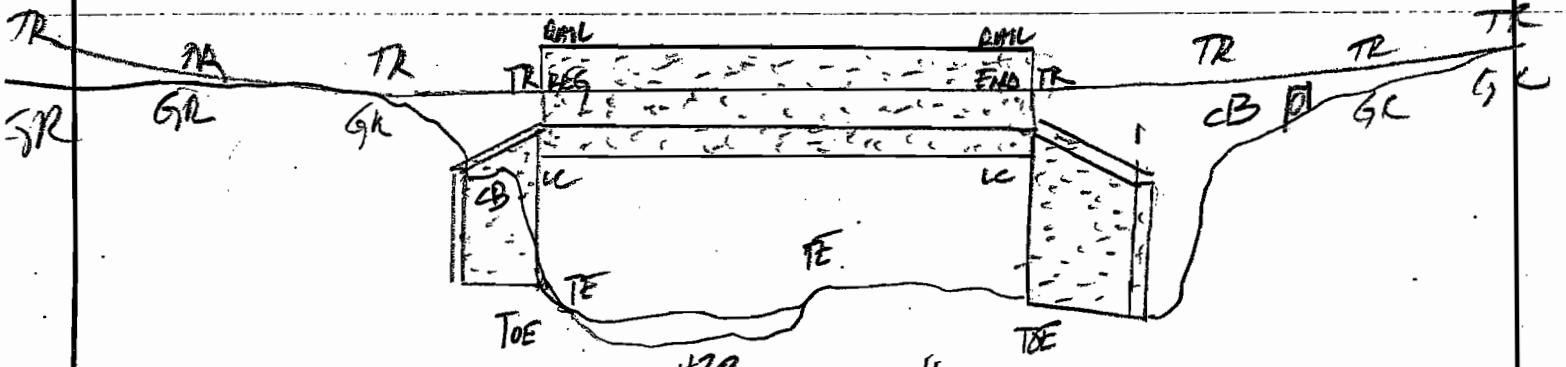
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "A" END CUT ON US RIGHT TOP SW @ ABUT

ADDL COMMENTS Shots 3932 – 3974

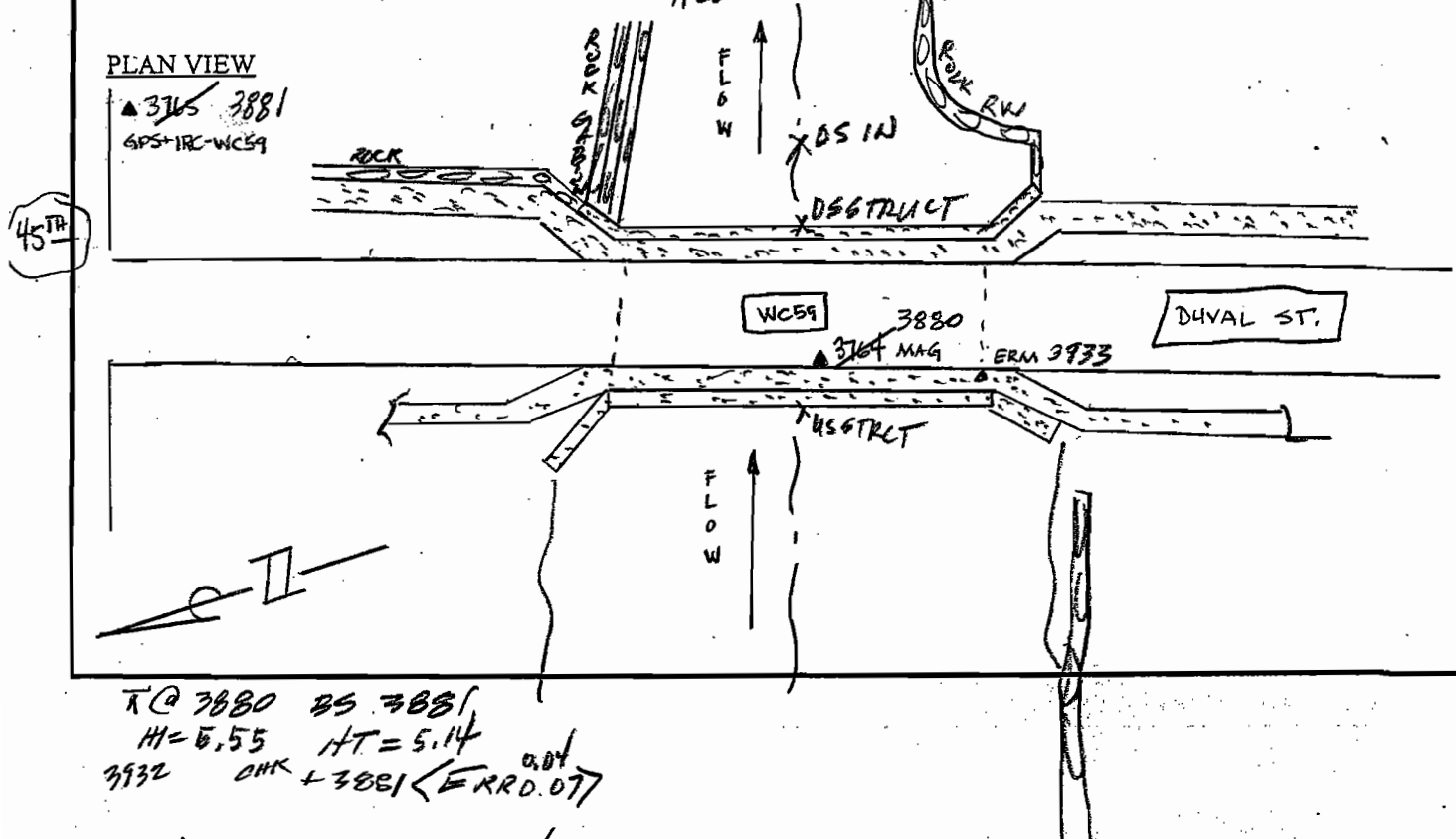
GPS Pts ~~3764/3765~~ 3880/3881

PROFILE VIEW



PLAN VIEW

▲ ~~3765~~ 3881
GPS+IRC-WC59



TC @ 3880 BS 3881
HI = 5.55 HT = 5.14
3932 CHK + 3881 < ERR 0.07 (0.04)

3974 CHK + 3881 < ERR. 0.07 (0.04)

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 60 BR

STREAM NAME: Waller Creek DATE: 12-05-07

LOCATION: 1ST Structure US of Duval / DS of Ave "G" CREW Moseley Brooks

TYPE BR (✓) CUL ( ) DAM (✓) XS ( ) ERM ELEV ERM ID 3976

BRIDGE RAIL ~~—~~ DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

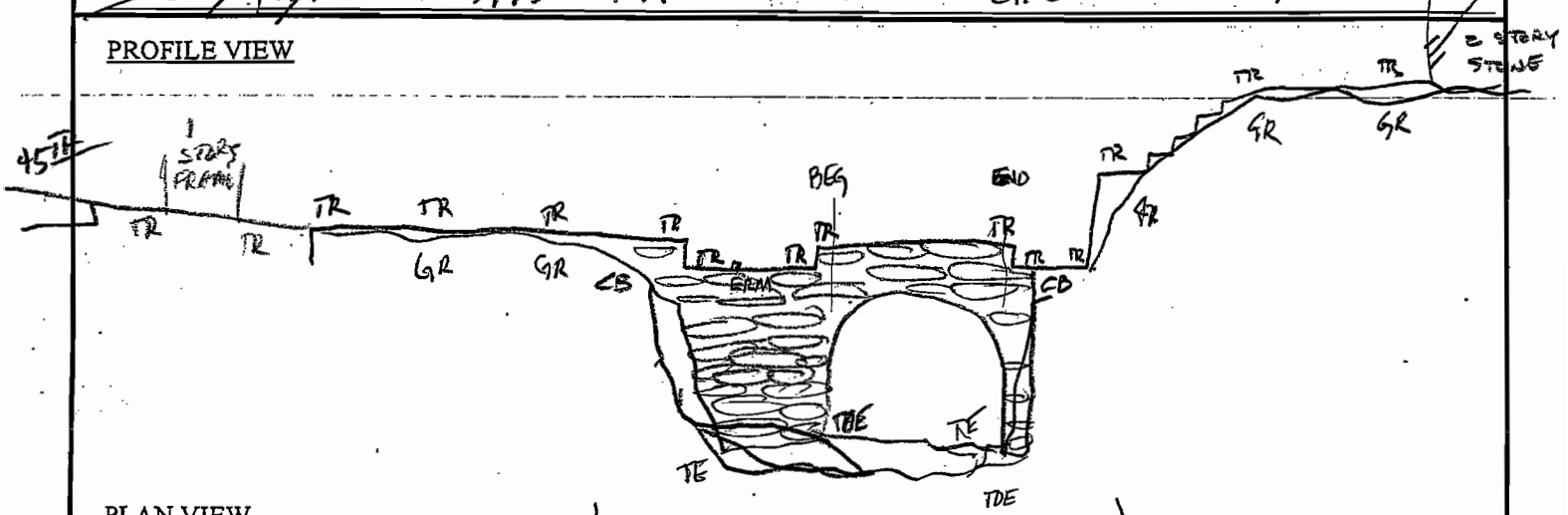
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: "D" cut on TR BR

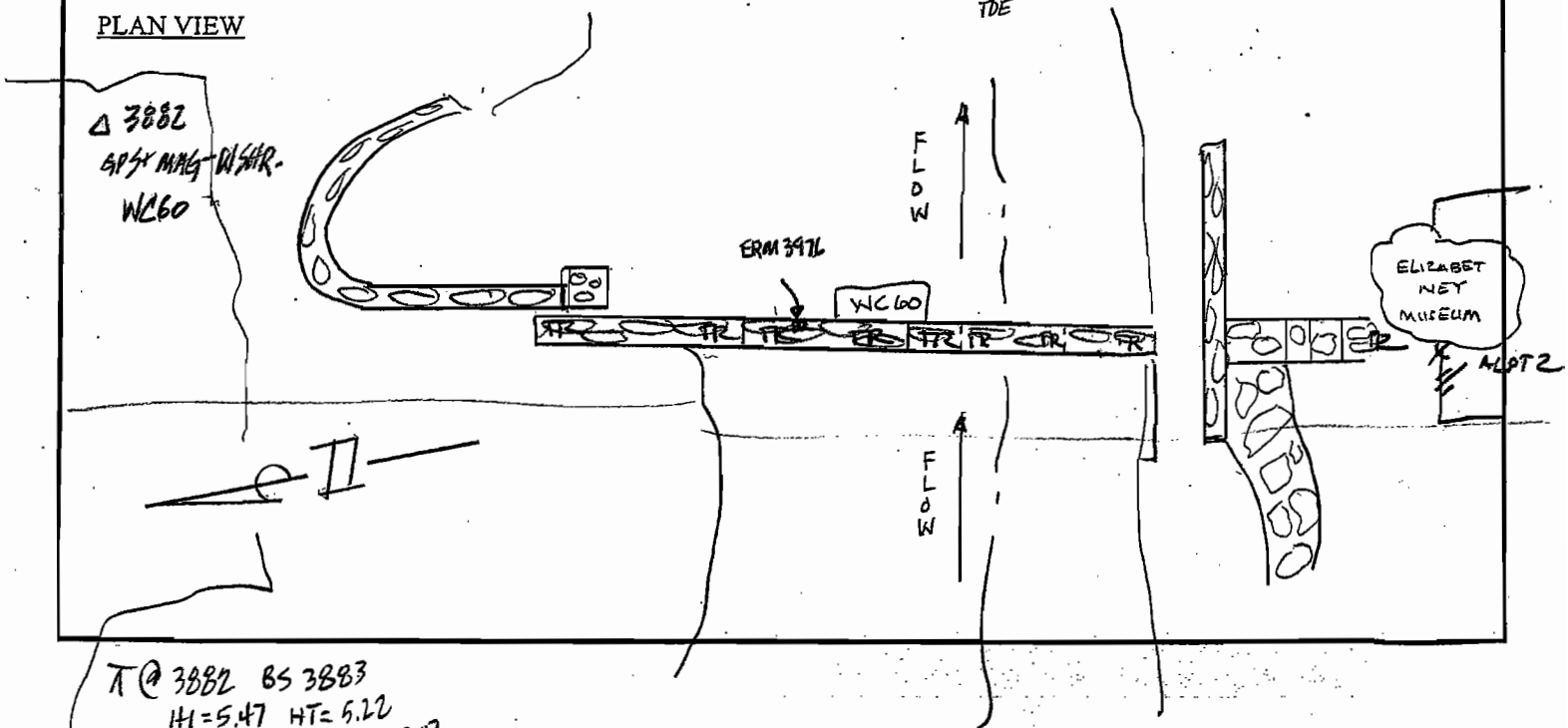
ADDL COMMENTS US of Duval / DS of Ave "G"

GPS ~~Pts 3766/3767~~ Shots 3975 – 4019 GPS PTS 3882/3883

PROFILE VIEW



PLAN VIEW



T@ 3882 BS 3883
HI = 5.47 HT = 5.22
3975 5.22 chk 3883 0.07 0.16

3883
Δ GPS+IRC-S

Coord

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC 61 Ped Br

STREAM NAME: Waller Creek DATE: 12-05-07

LOCATION: 2nd Structure US of Duval / DS of Ave "G" CREW Moseley Brooks

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4021

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

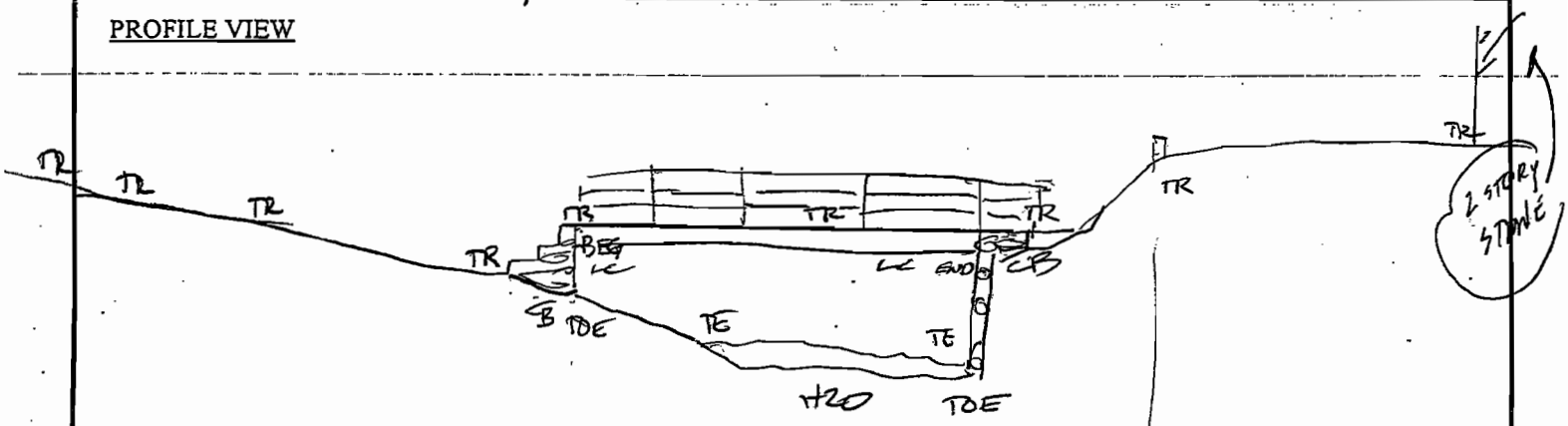
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" cut US Left Top Stone About @ Steps #4021

ADDL COMMENTS Shots 4020 - 4061 Ped Br. From 45th to Elizabeth Ney Museum

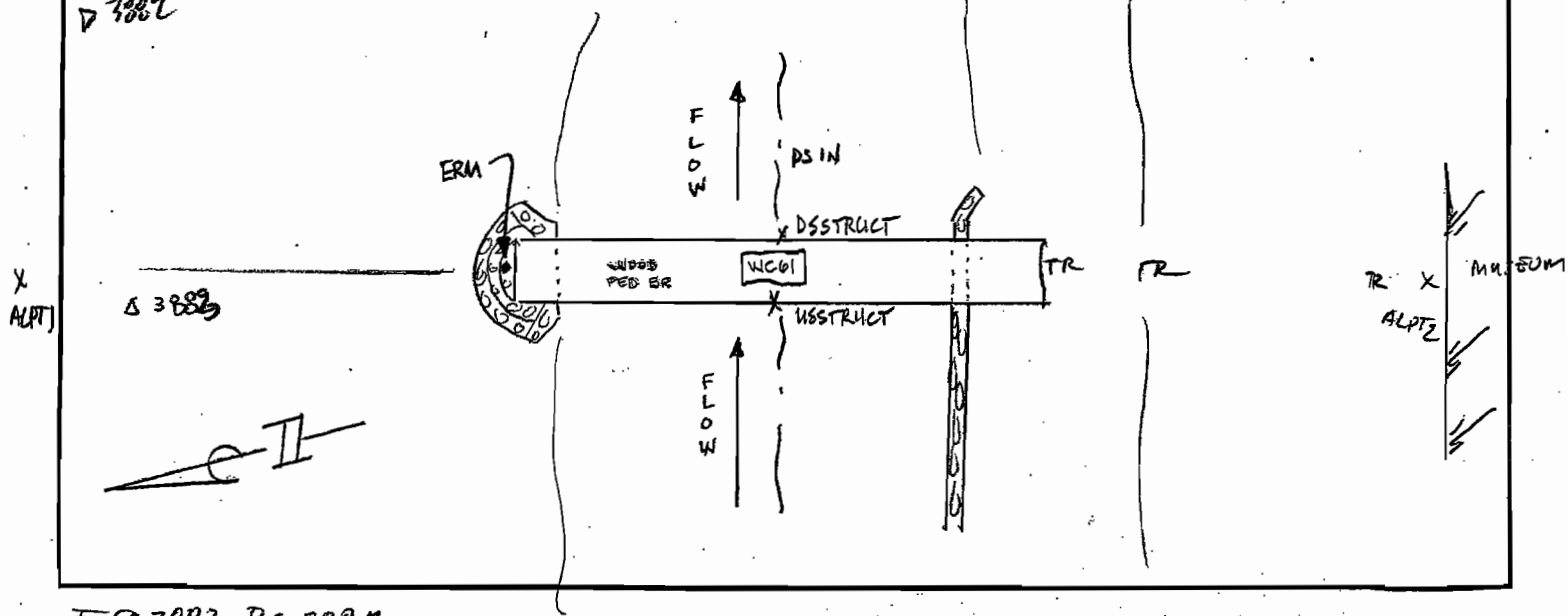
GPS Pts ~~3766/3767~~ 3882/3883 @ Back Lot Fronting

PROFILE VIEW



PLAN VIEW

D 3882



T @ 3883 BS 3882

HI = 5.43 HT = 5.24

4020 5.24 CHK 3882 <ERR .07 .14>

4021

4061 CHK 3882 <ERR .07 .14>

COORD 1 of 4

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME BR WC62

STREAM NAME: WALLER CREEK DATE: 12-06-07

LOCATION: AVE "G" CREW MOSELEY COMBS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4070

BRIDGE RAIL 4.3 DECK _____ WIDTH _____ PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

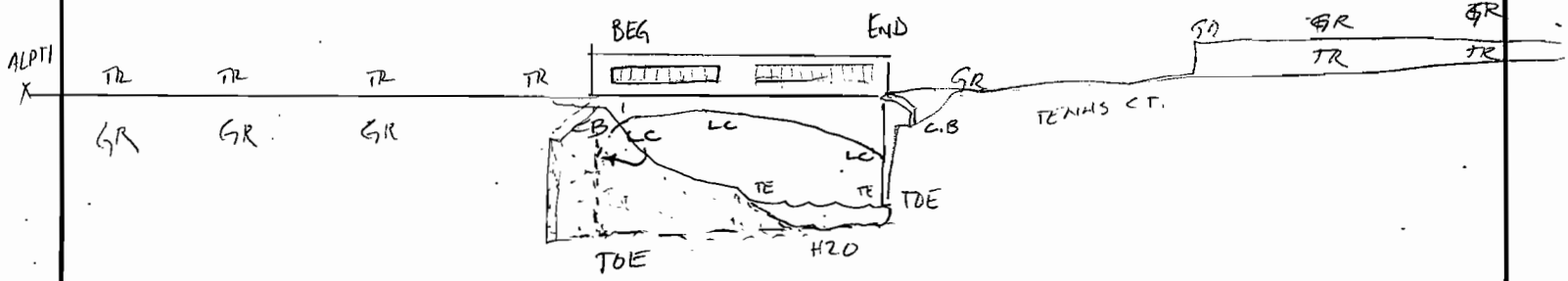
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" FND CUT ON US RIGHT TOP CRB @ ABUT. # 4070

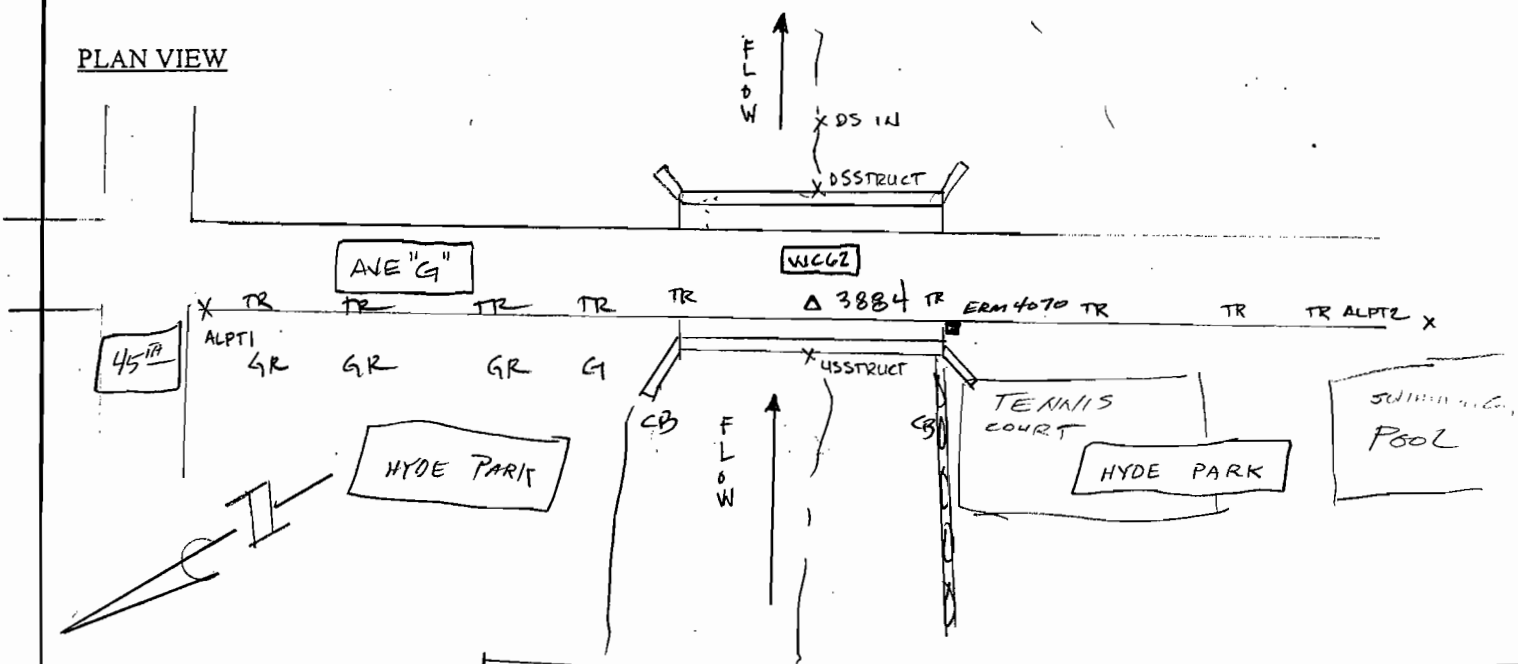
ADDL COMMENTS SHOTS 4069 - 4109

GPS Pts 3884 / 3885 SHOT AS BRIDGE / HAS # CONC. BOTTOM

PROFILE VIEW



PLAN VIEW



T @ 3884 BS 3885

HI = 5.53 HT = 5.55

4069 5.55 CHK + 3885 ⟨ERR. 0.05 / 0.03⟩

4070 5.80 ERM - BR - WC62

4109 5.55 CHK + 3885 - WC63 ⟨ERR 0.01 / 0.05⟩

WC63 | PED BR

Δ 3885 GPS+IRC — WC63

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC63 PED BR.

STREAM NAME: WALLER CREEK DATE: 12-07-07

LOCATION: HYDE PARK - US OF AVE "G" / DS OF AVE "F" CREW MOSELEY COMBS McCRANEY

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4111

BRIDGE RAIL 3.5 DECK 0.9 WIDTH 9.0 PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

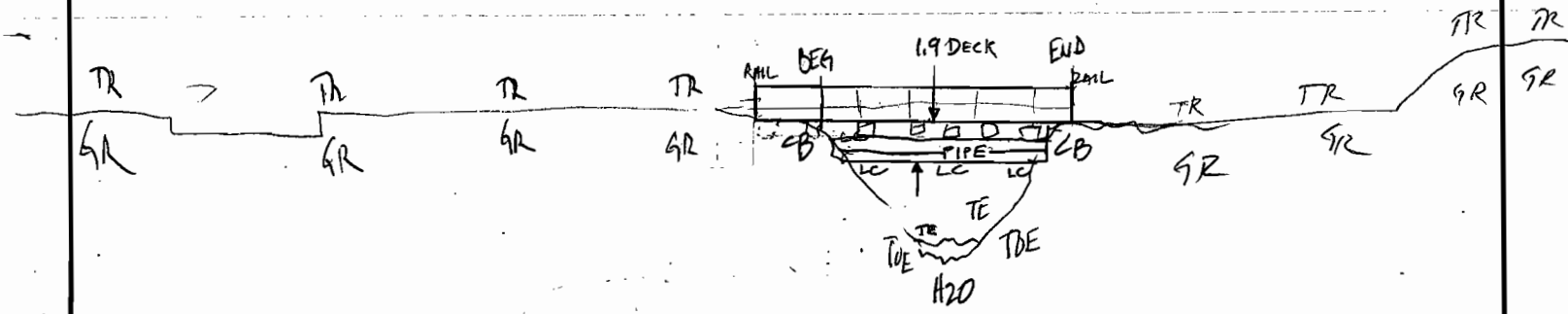
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: "D" CUT ON DS RIGHT TOP ABUT. #4111

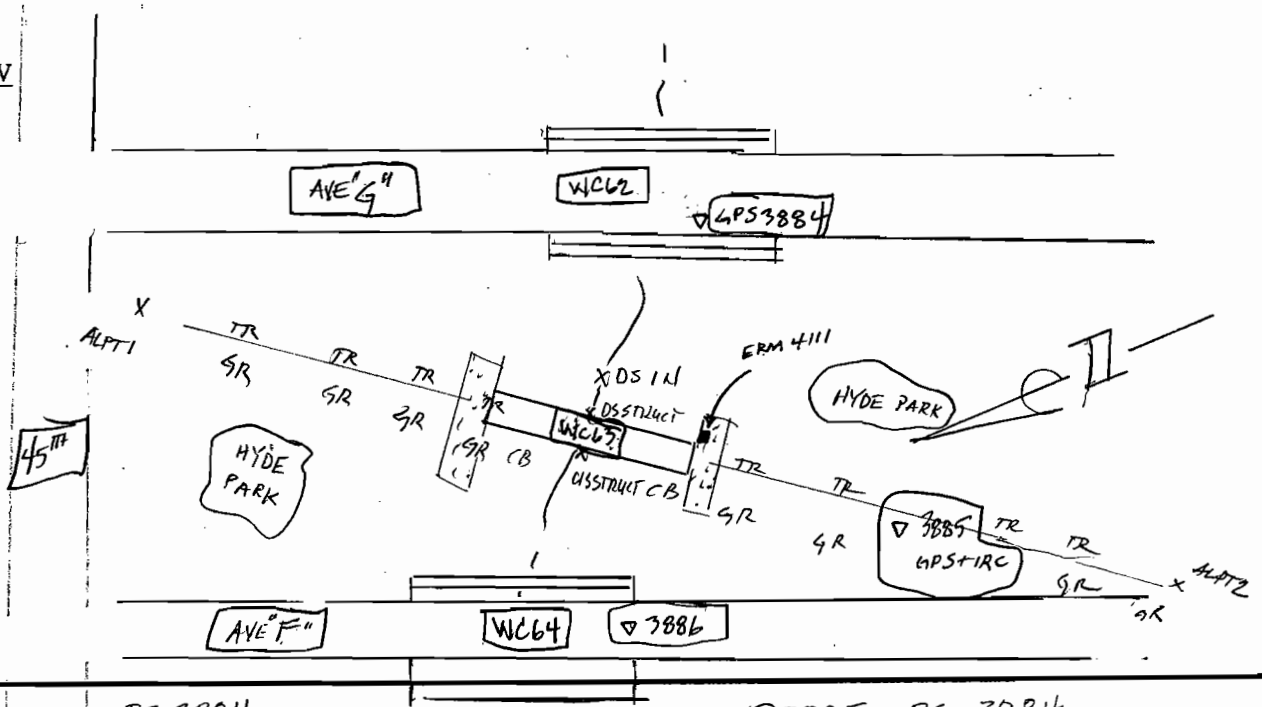
ADDL COMMENTS SHOTS 4110 - 4154 RE SHOOT LC @ BOTTOM PIPE

GPS PTS 3884, 3885, 3886 overwrite 4131, 4148, 4149 (LC)

PROFILE VIEW



PLAN VIEW



TC@3885 BS 3884
HT = 5.54 HI = 5.39

4110 5.39 CHK + 3884 <ERR 0.05 0.03>
4111 5.32 CHK + 3886 <ERR 0.10 0.07>
4154 5.39 CHK + 3884

TC@3885 BS 3884
HI = 5.54 HT = 5.39

4194 5.39 CHK + 3884 <0.05 0.07>
overwrite LC @ Bott PIPE 4131 4148 4149 5.39 CHK + 3884 <0.06 0.04>

GOOD 3 of 4

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 64 CUL

STREAM NAME: WALLER CREEK DATE: 12-07-07

LOCATION: AVE F CREW MOSELEY COMBS McCRANEY

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4156

BRIDGE RAIL 3.5 DECK 2.0 WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE BOX LENGTH _____ SIZE H: 5.5 W: 7.5 SKEW —

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

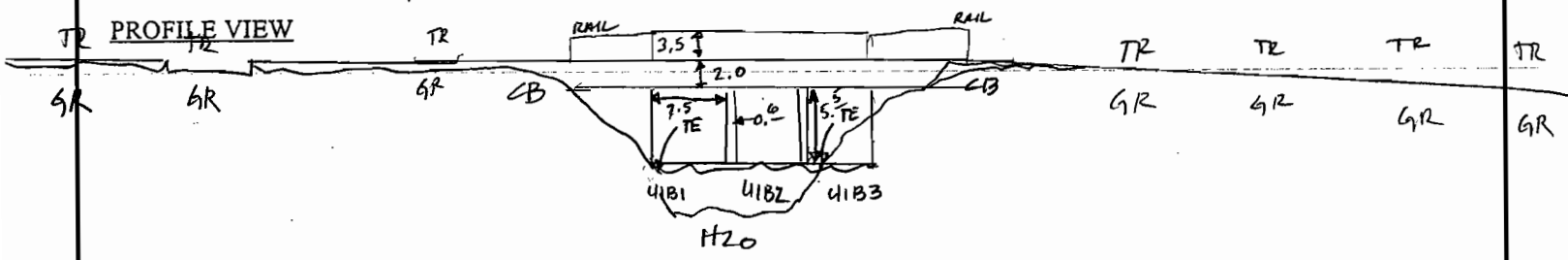
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: COA BRASS DISC FND DS LEFT BEG BR #4156

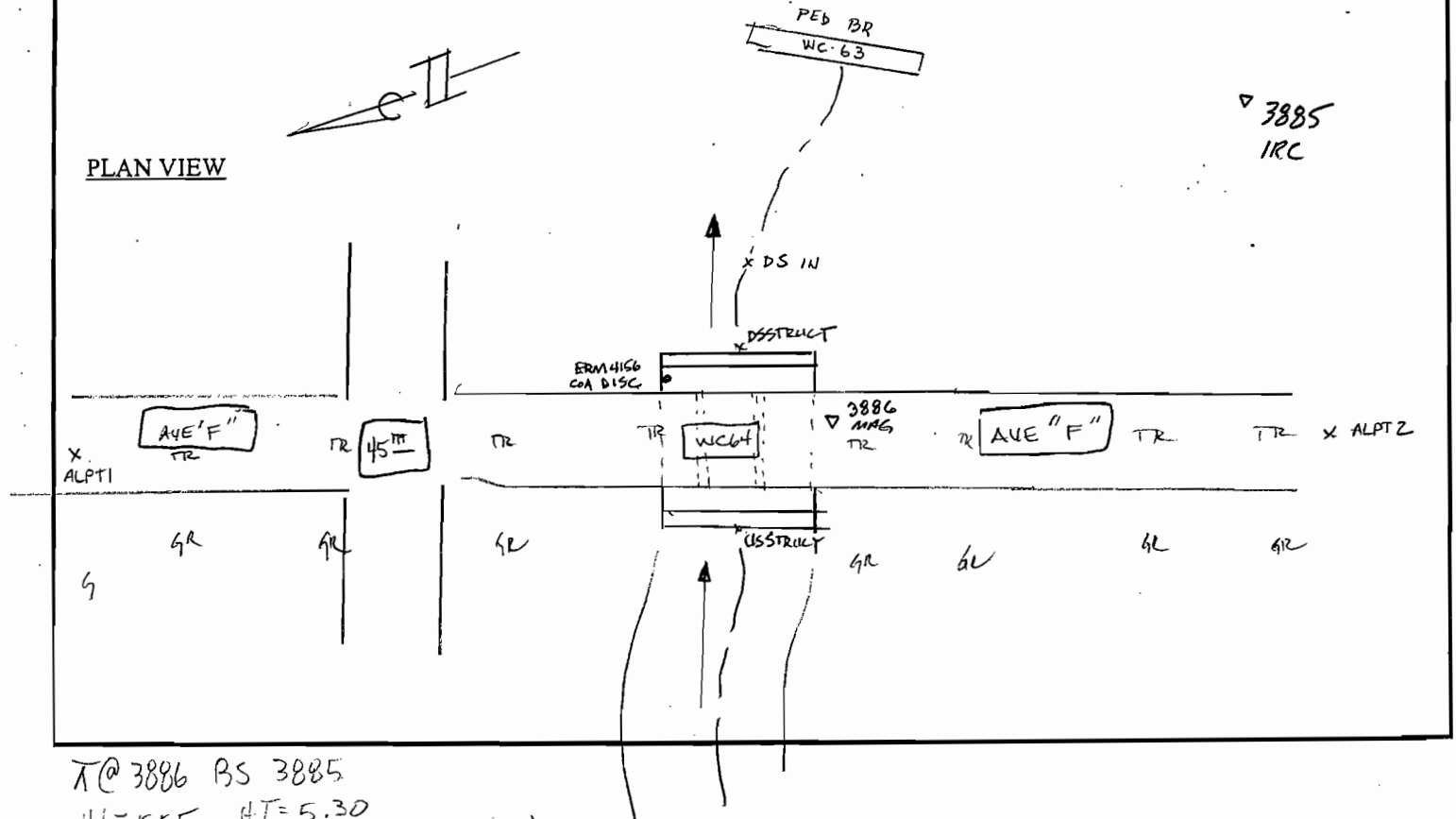
ADDL COMMENTS SHOTS 4155 – 4193

GPS PTS 3886/3885

PROFILE VIEW



PLAN VIEW



T@3886 BS 3885

HI = 5.55 HT = 5.30

4155 5.30 CHK 3885 ERR 0.06 0.05

4156

4193 CHK 3885 ERR 0.06 0.00

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME CuL WC65

STREAM NAME: Waller Creek DATE: 12-07-07

LOCATION: 45th St. CREW Moseley

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4201

BRIDGE RAIL 3.5 DECK 0.9 WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE BOX LENGTH _____ SIZE H: 4.0 W: 12.0 SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

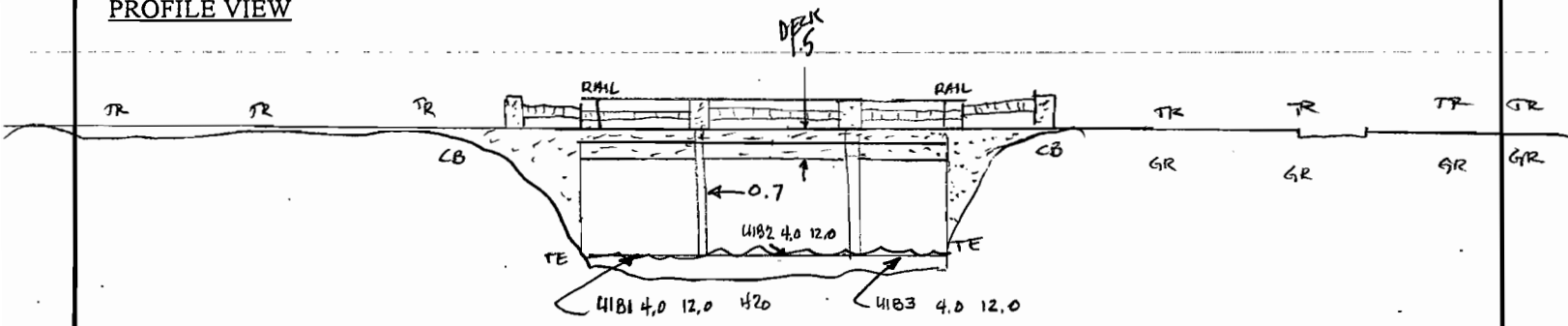
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "J" cut on US Left Top Curb @ Beg. Br. # 4201

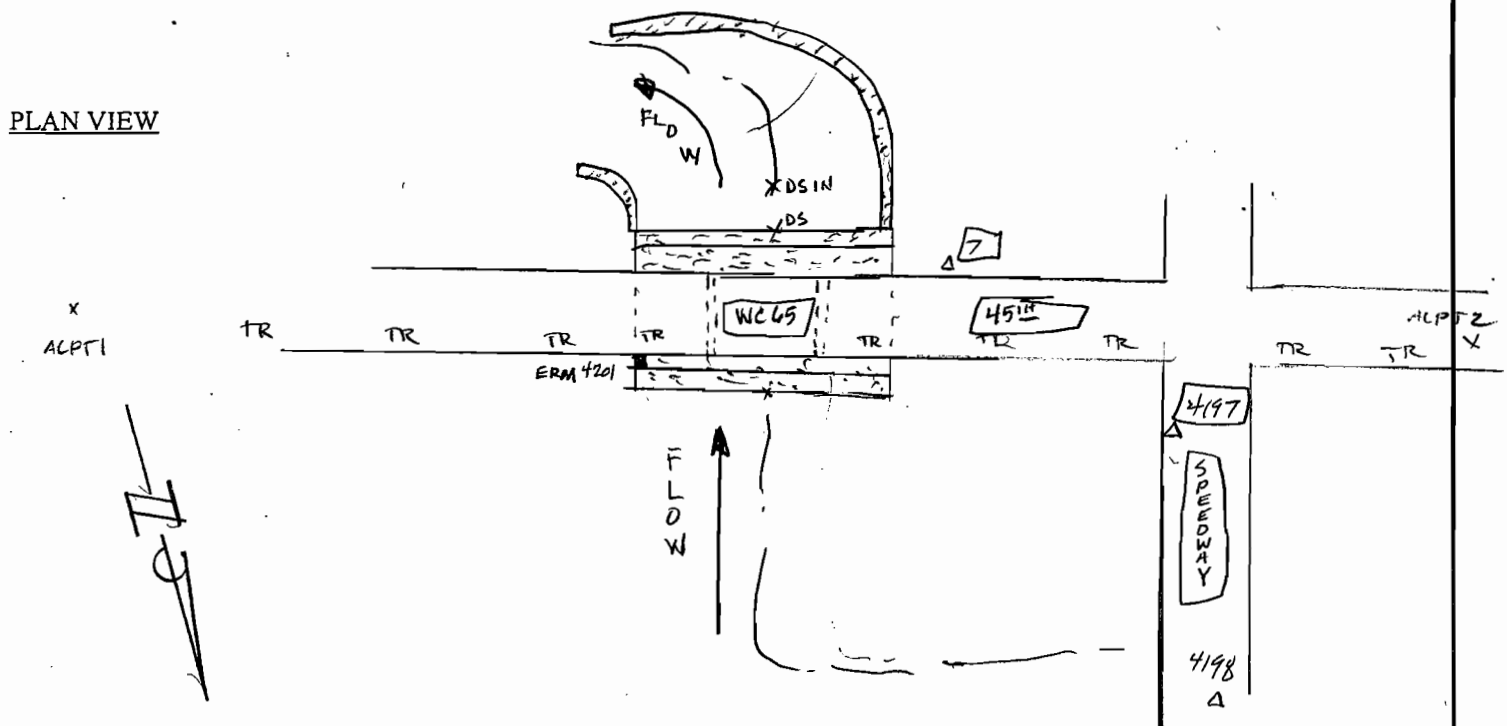
ADDL COMMENTS Shots 4200 – 4239

GPS Pts 7, 4197

PROFILE VIEW



PLAN VIEW



T@7 BS4197

HI = 5.50 HT = 5.42

4200 5.42 CHK+4197 < ERR, .12 .11 >

4201 ERM

4239 5.42 CHK+4197 < ERR >

6000

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC66 CuL

STREAM NAME: Waller Creek DATE: 12-07-07

LOCATION: Speedway (200' N. of 45th) CREW Moseley Combs Thomason

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4335

BRIDGE RAIL 3.5 DECK 1.0 WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

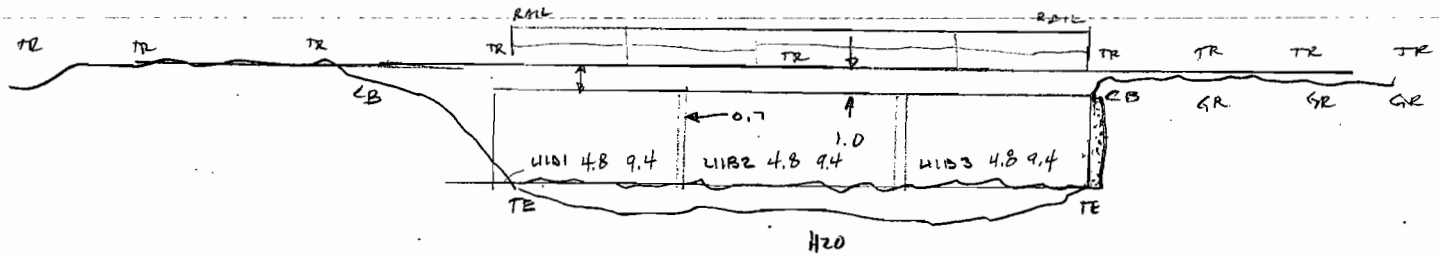
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" FND CUT ON US RIGHT Top Curb @ End Culv.

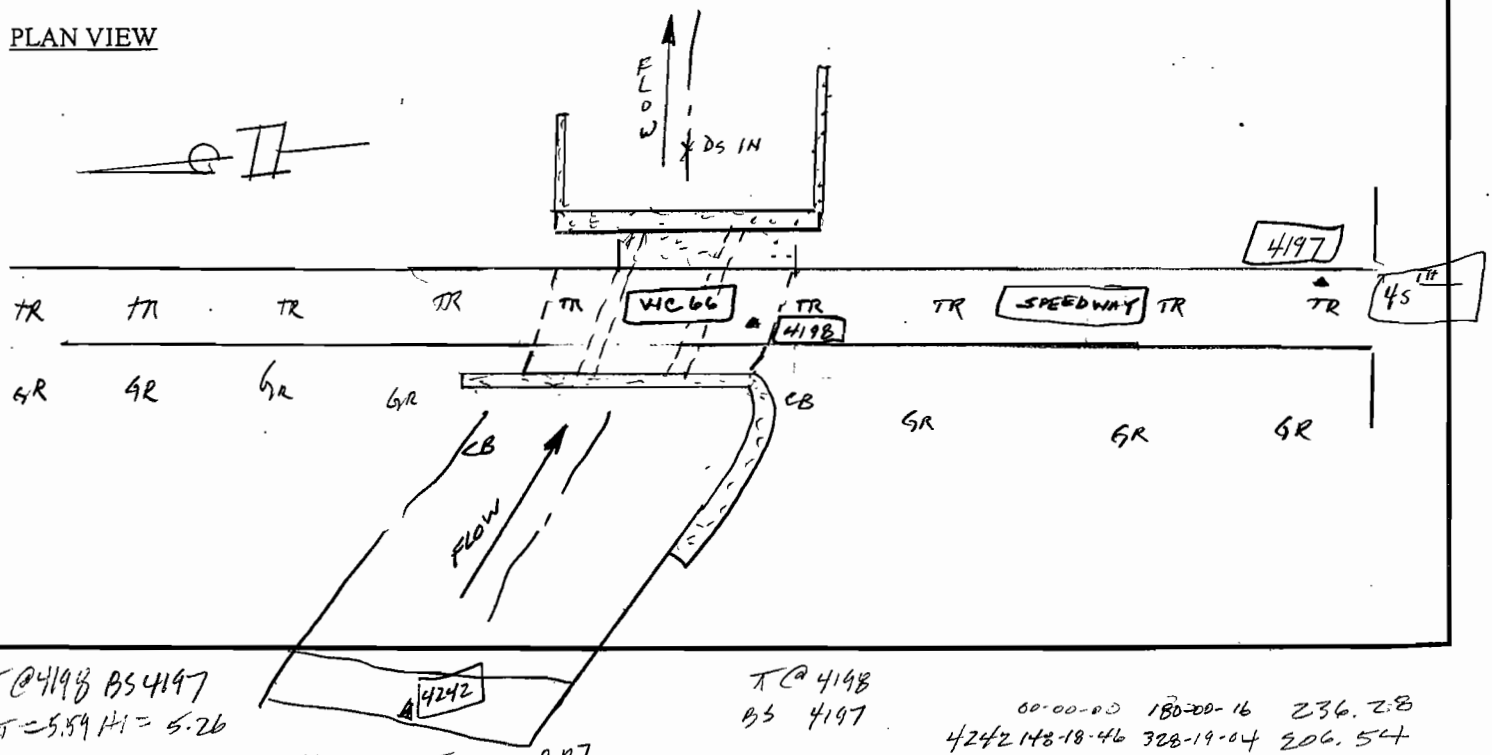
ADDL COMMENTS Shots 4334 - 4373

GPS Pts 4197, 4198, 4242

PROFILE VIEW



PLAN VIEW



T @ 4198 BS 4197
HT = 5.59 HI = 5.26

*4334 5.26 CHK = 4197 ERR. 0.07
4242 5.11 CHK = 4242 ERR 0.02
TPT + CHK - WC67

T @ 4198
BS 4197

00-00-00 180-00-16 236.28
4242 148-18-46 328-19-04 206.54

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC67

STREAM NAME: WALLER CREEK DATE: 12-10-07

LOCATION: PED BR +/- 200' US OF WC66 (SPEEDWAY) CREW MOSELEY COMBS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4375

BRIDGE RAIL 3.5 DECK 1.5 WIDTH 10.5 PIER(s) ____ @ _____ PIER SHAPE _____

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

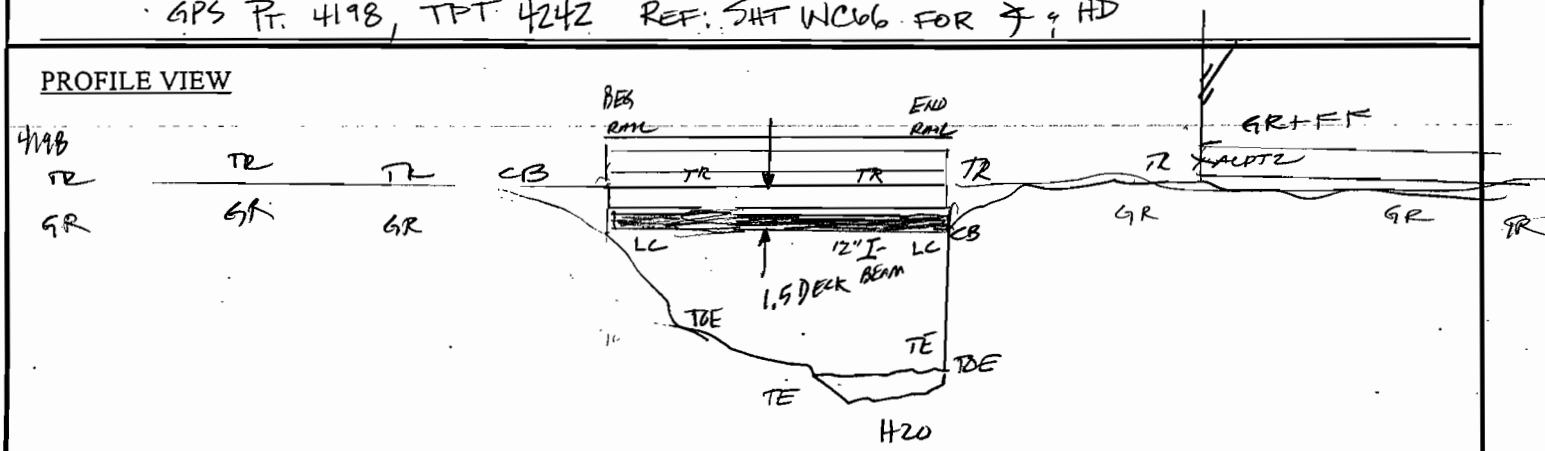
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US LEFT TOP DECK @ BEG BR.

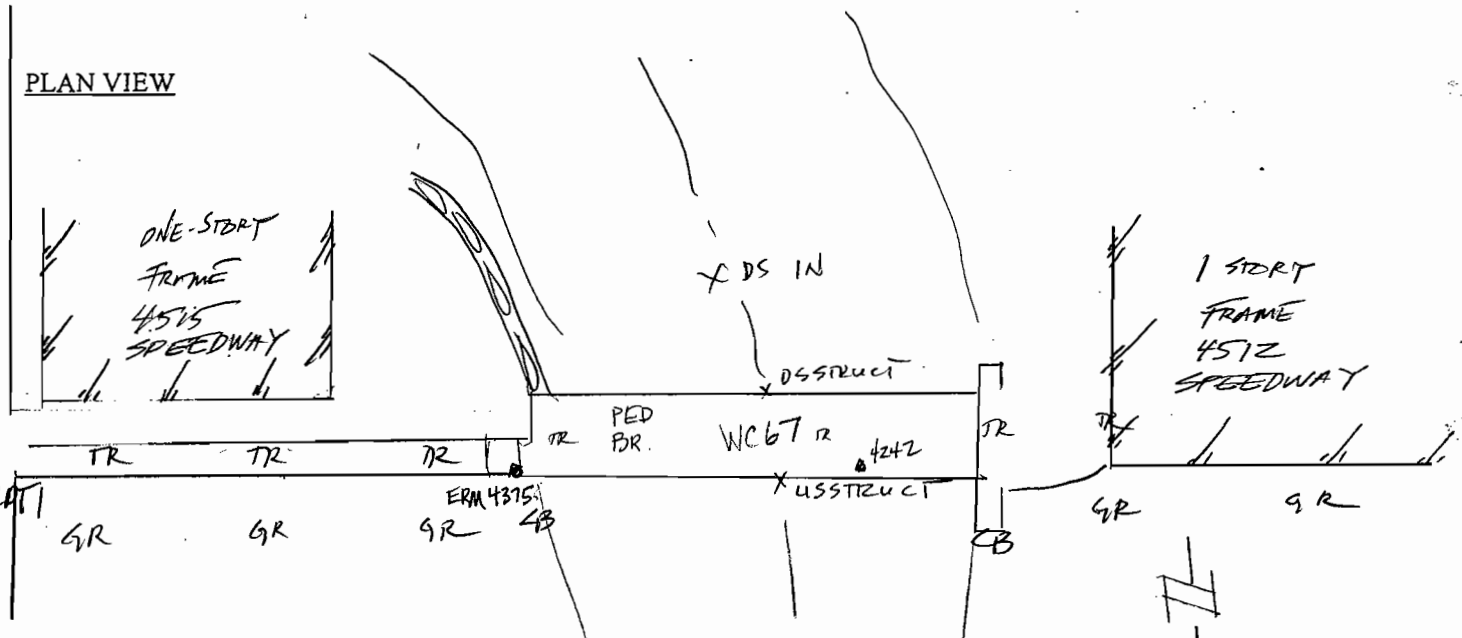
ADDL COMMENTS SHOTS 4374-4413

GPS PT. 4198, TPT 4242 REF: SHT WC66 FOR ↗ & HD

PROFILE VIEW



PLAN VIEW



T @ 4242 BS 4198

HI = 5.24 HT = 5.36

4374 5.36 CHK + 4198 ⟨ERR ⟩

4413 5.36 CHK + 4198 ⟨ERR 0.02 0.02⟩

GOOD

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC68

STREAM NAME: Waller Creek DATE: 12-10-07

LOCATION: E. 46TH St. CREW Moseley Combs Thomason

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4294

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE Box LENGTH _____ SIZE H: 4.7 W: 8.5 10.3 SKEW _____

CULVERT I/O TYPE _____ MATERIAL Conc. WINGWALL US: 20' DS: 20'

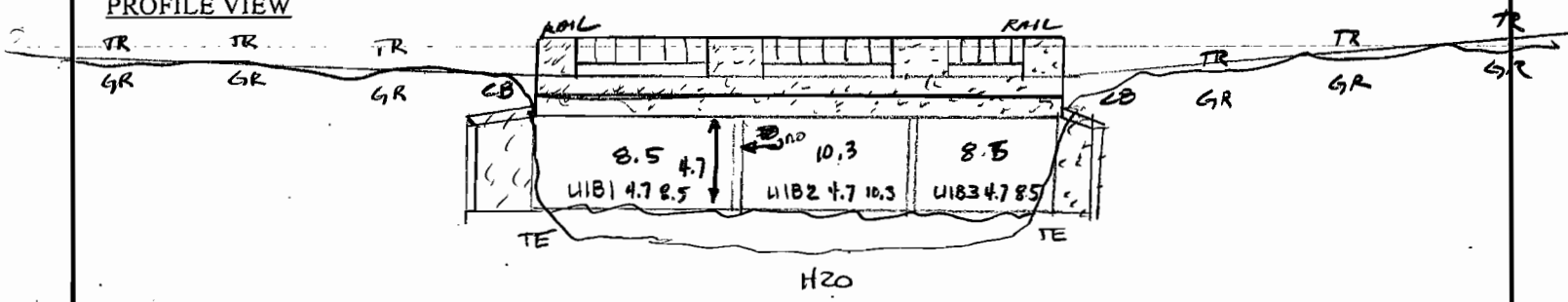
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" FND ON DS LEFT Top Curb @ Beg. Br.

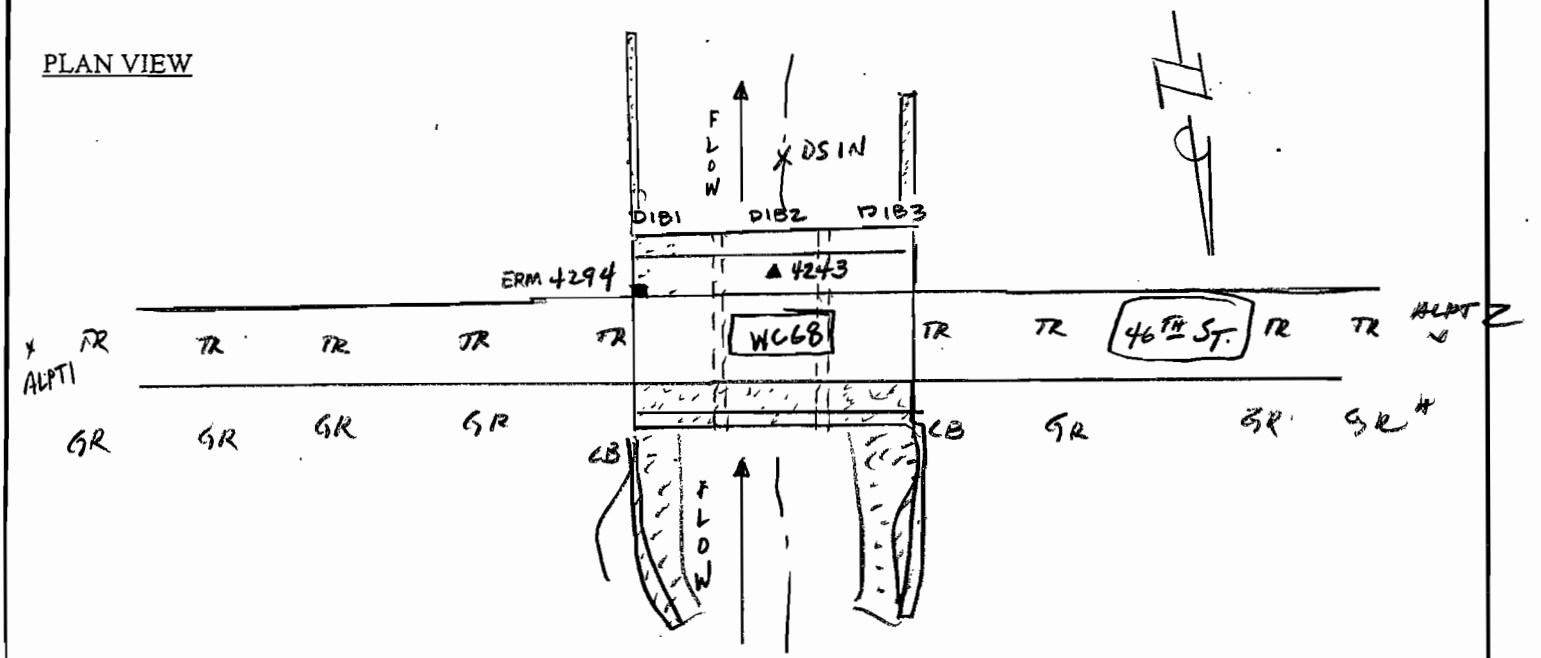
ADDL COMMENTS 4293 – 4333

GPS PTS 4243, 4244

PROFILE VIEW



PLAN VIEW



T @ 4243 BS 4244

HI = 5.57 HT = 5.44

4293 5.44 CHK 4244 ERR .04 .19

4333 5.44 CHK 4244 ERR .04 .19

GOOD

1 of 2

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC70 PED BR

STREAM NAME: WALLER CREEK DATE: 12-10-07

LOCATION: PED BR DS OF 51ST @ INTRAMURAL FIELDS CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4248

BRIDGE RAIL 3.6 DECK 1.0 WIDTH 8.5 PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

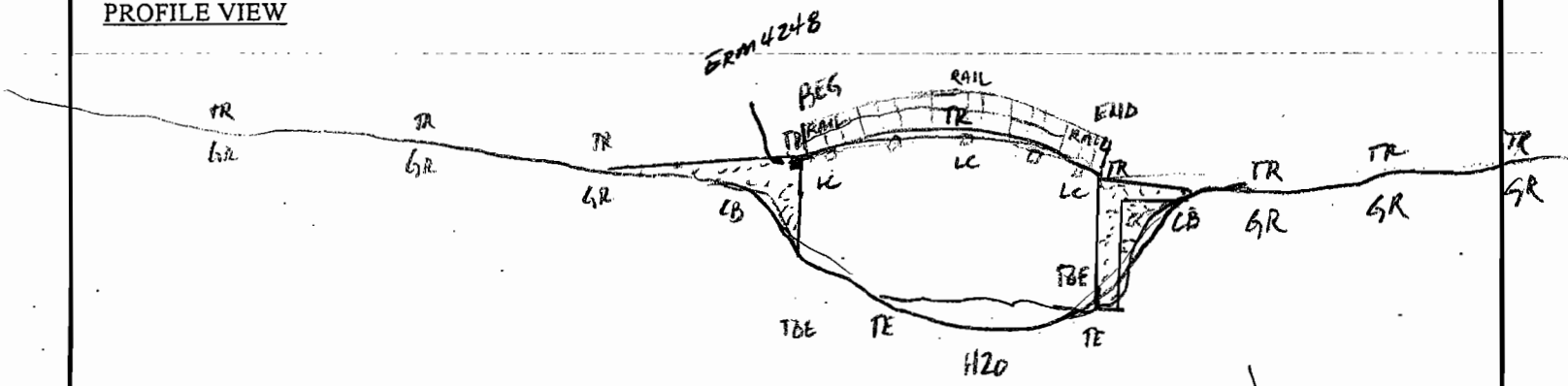
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" CUT ON US LEFT TR @ ABUT

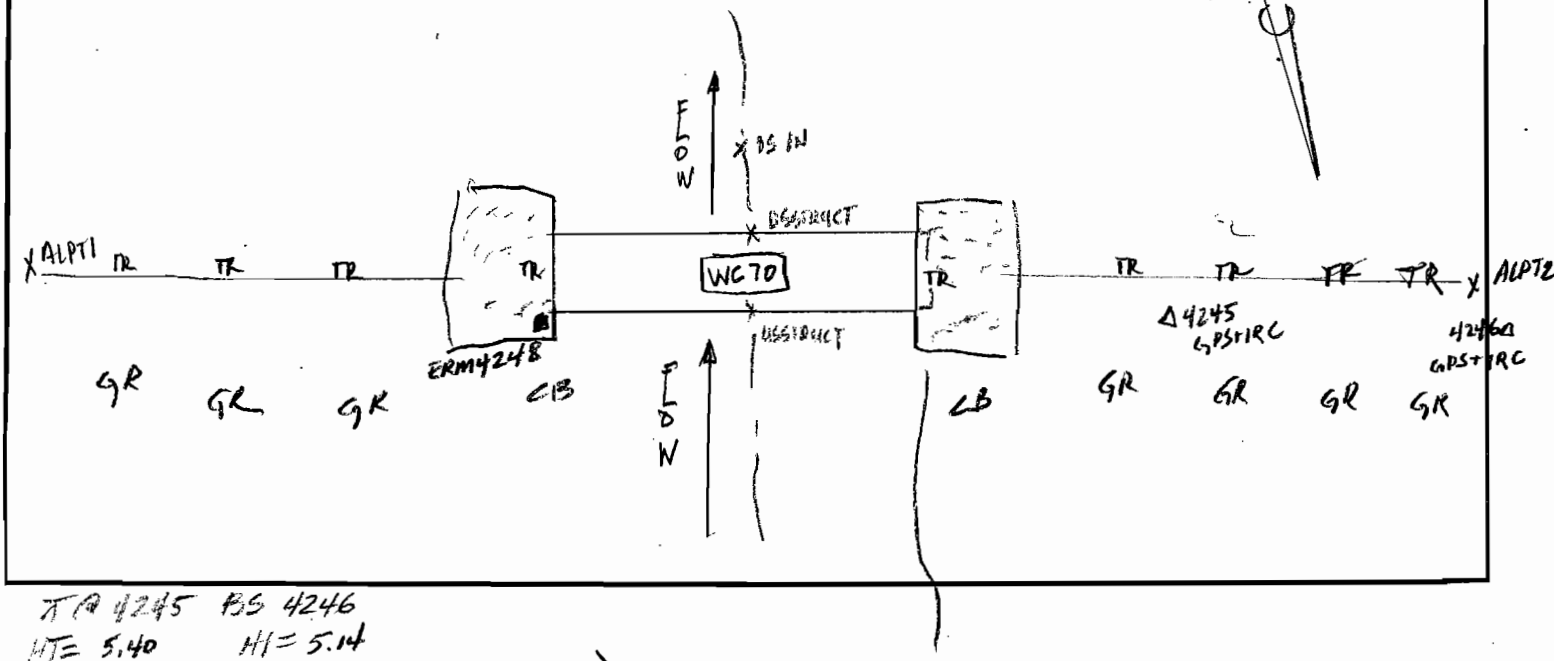
ADDL COMMENTS SHOTS 4247–4292

GPS PTS 4245, 4246

PROFILE VIEW



PLAN VIEW



TA 4245 BS 4246

HT= 5.40 HI= 5.14

4247 5.14 CHK+4246 <ERR 0.04 0.01>

4248

4292 5.14 CHK+4246 <ERR. 0.04 0.00>

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME CuL WC71

STREAM NAME: WALLER CREEK DATE: 12-11-07

LOCATION: 51st STREET CREW MOSESEY COMBS THOMASON

TYPE BR ( ) CUL (X) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4419

BRIDGE RAIL 3.5 HI DECK 1.3 WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 4 SHAPE SQ LENGTH _____ SIZE H: 5.0 W: 9.0 SKEW _____

CULVERT I/O TYPE _____ MATERIAL CONC WINGWALL US: _____ DS: _____

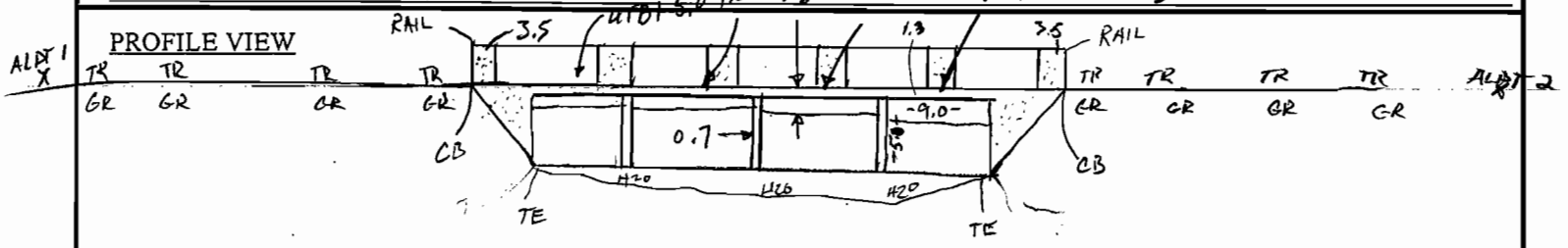
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" ON US LEFT TOP CRB @ BEG. CuL

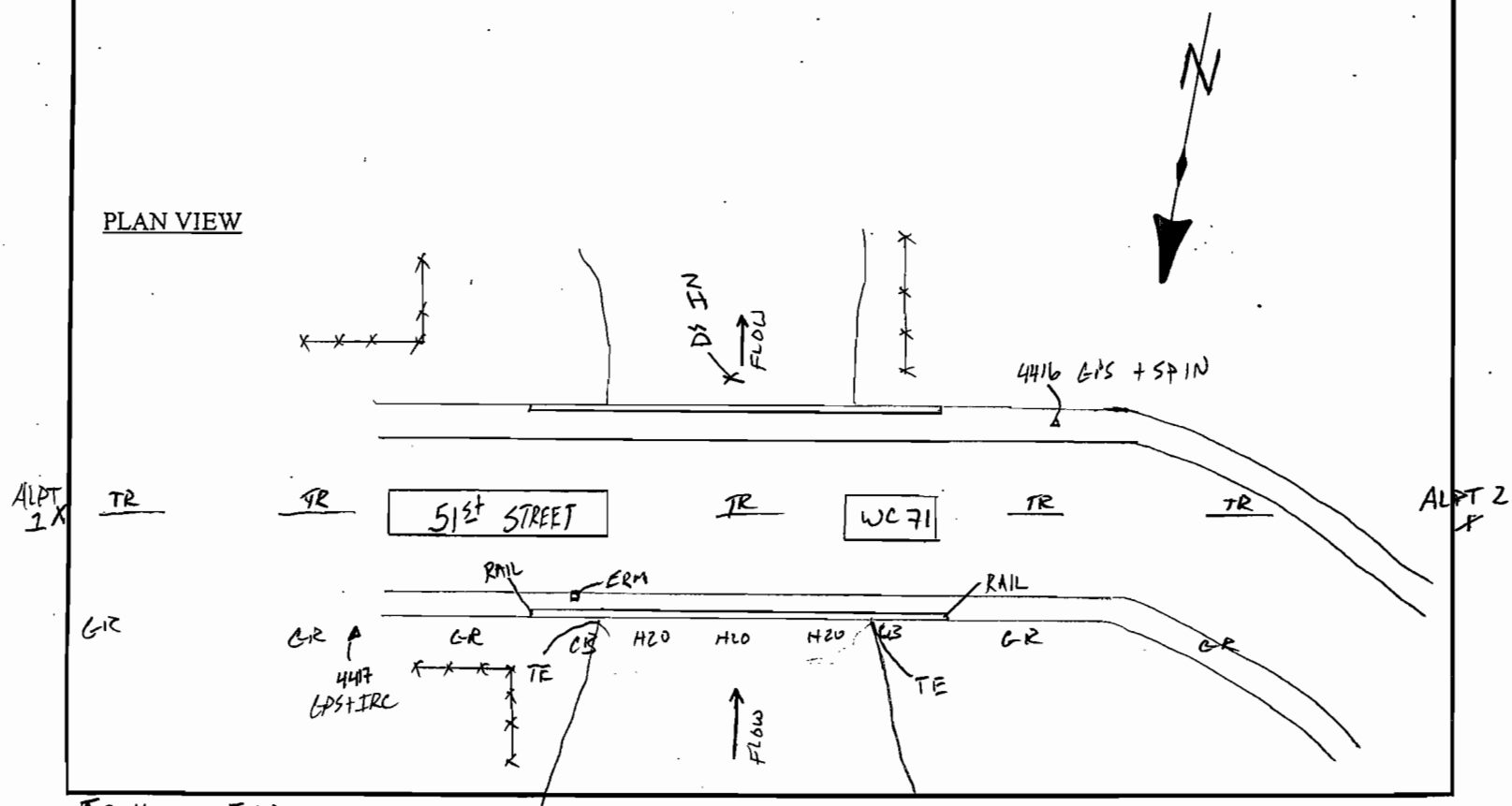
ADDL COMMENTS SHOTS 4418 - 4461

GPS PTS 4416, 4417

PROFILE VIEW



PLAN VIEW



T @ 4416 5.62

BS @ 4417 5.39

4418 5.39 CHK + 4417 < ERR 0.08 0.07 >

4461 5.39 CHK + 4417 < ERR 0.08 0.09 >

PROJECT: Waller Creek Flood Study STRUCTURE NAME CuL WC73

STREAM NAME: Waller Creek DATE: 12-12-07

LOCATION: North Loop CREW Moseley Combs Thomason

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4470

BRIDGE RAIL 3.5 DECK 1.5 WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 3 SHAPE BOX LENGTH _____ SIZE H: 4.9 W: 8.0 SKEW —

CULVERT I/O TYPE _____ MATERIAL Conc. WINGWALL US: _____ DS: _____

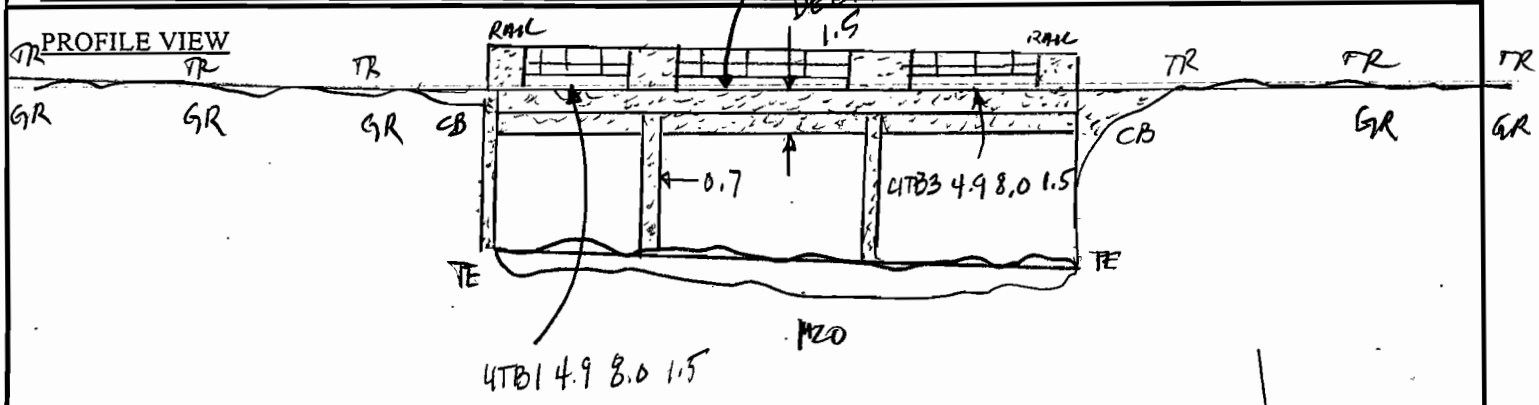
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" FND. ON US RIGHT TOP CRB @ END CuL

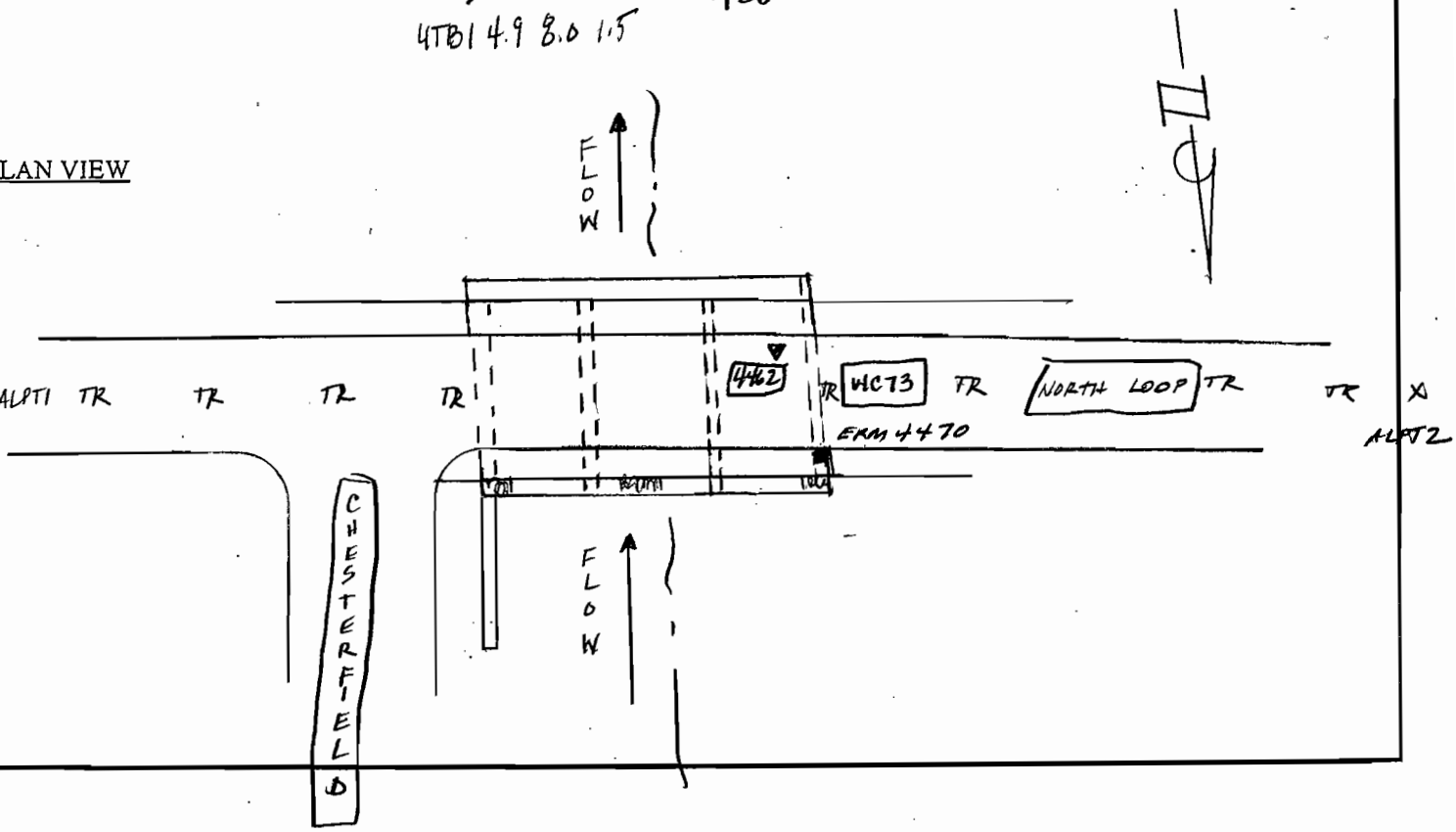
ADDL COMMENTS Shots 4470 - 4507 4TB2 4.9 8.0 1.5 STRUCTURE RTK'D

GPS PT 4462

PROFILE VIEW



PLAN VIEW



PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC74 BR

STREAM NAME: WALLER CREEK DATE: 12-12-07

LOCATION: FRANKLIN BLVD CREW MOSELEY COMBS THOMASON,

TYPE BR (X) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4509/4512

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

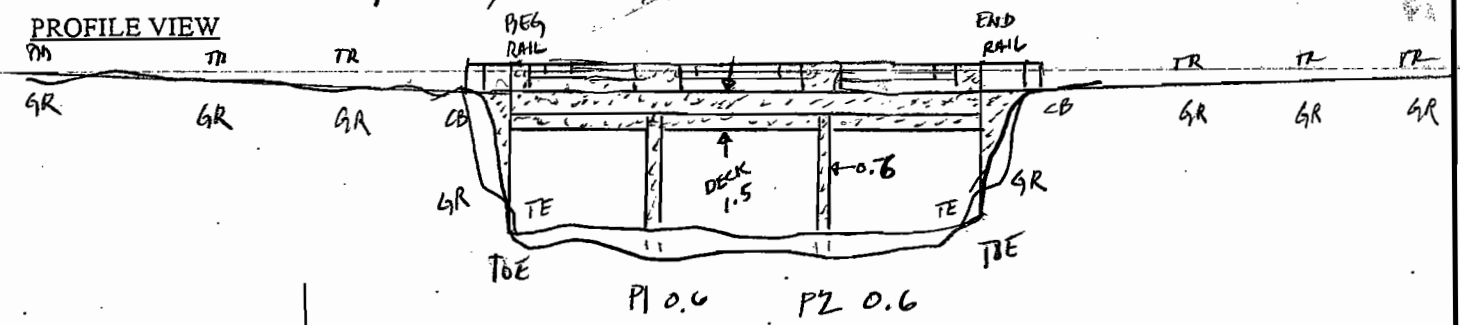
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "D" CUT ON US LEFT TOP CRB @ BEG BR #4509

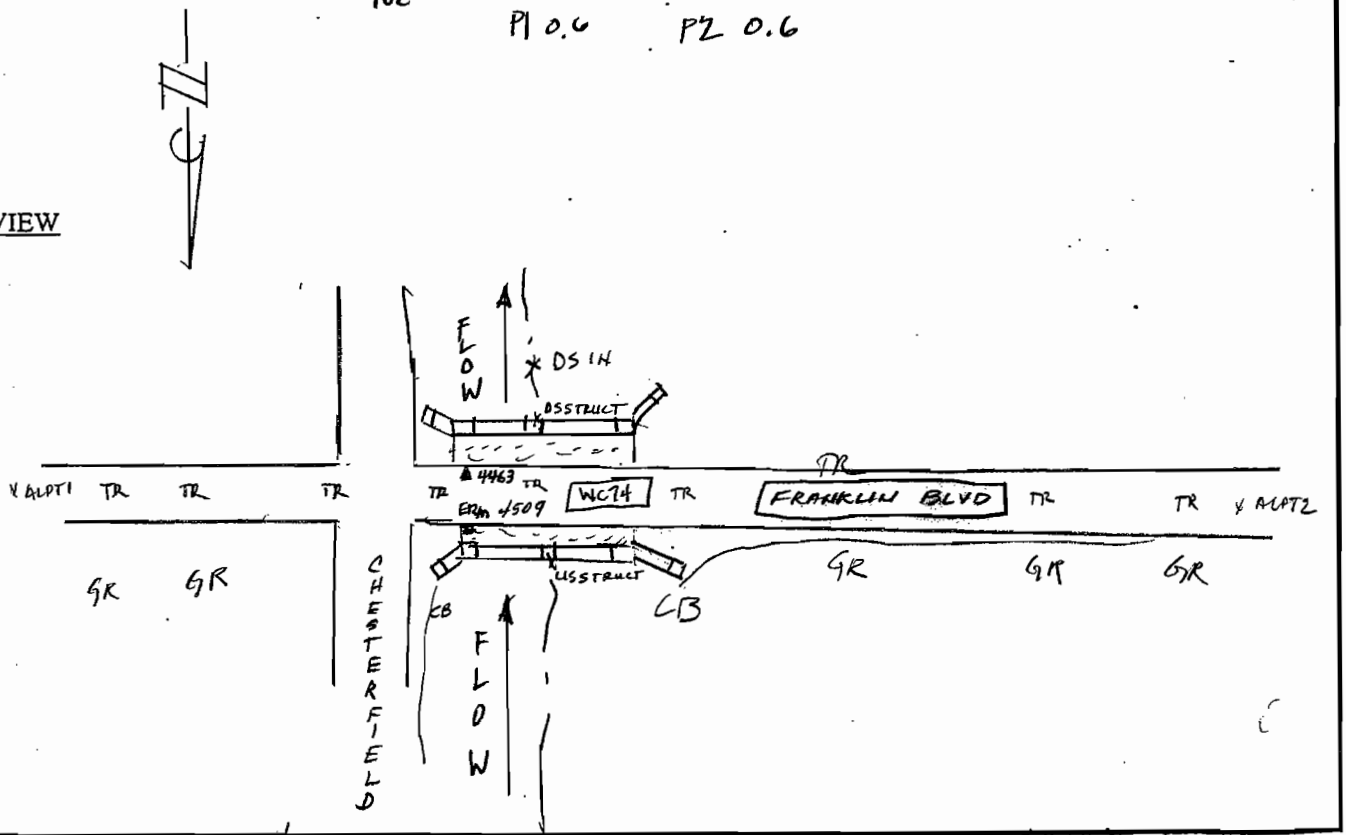
ADDL COMMENTS SHOTS ~~4501~~ 4511 – 4556

GPS PTS 4462/4463, 4464

PROFILE VIEW



PLAN VIEW



T @ 4462 BS 4464

HI = 5.10 HI = 5.21

4556 5.21 CHK + 4464 ⟨0.03, 0.02⟩

4511 5.21 CHK + 4464 ⟨0.008, 0.035⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC75 BR

STREAM NAME: WALLER CREEK DATE: 12-13-07

LOCATION: NELRAY BLVD CREW MOSELEY COMBS EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4558

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 2 @ 0.7 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

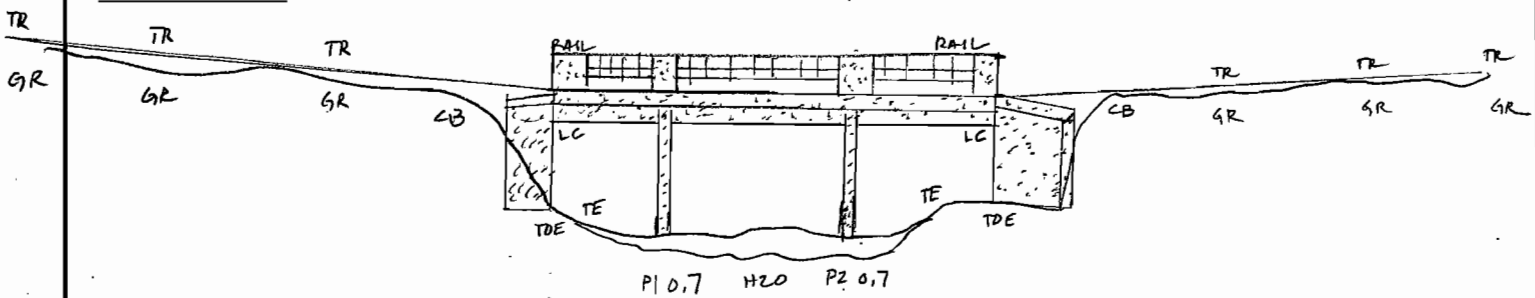
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: COA DISC FND ON US LEFT TOP DECK @ BEG. BR. #

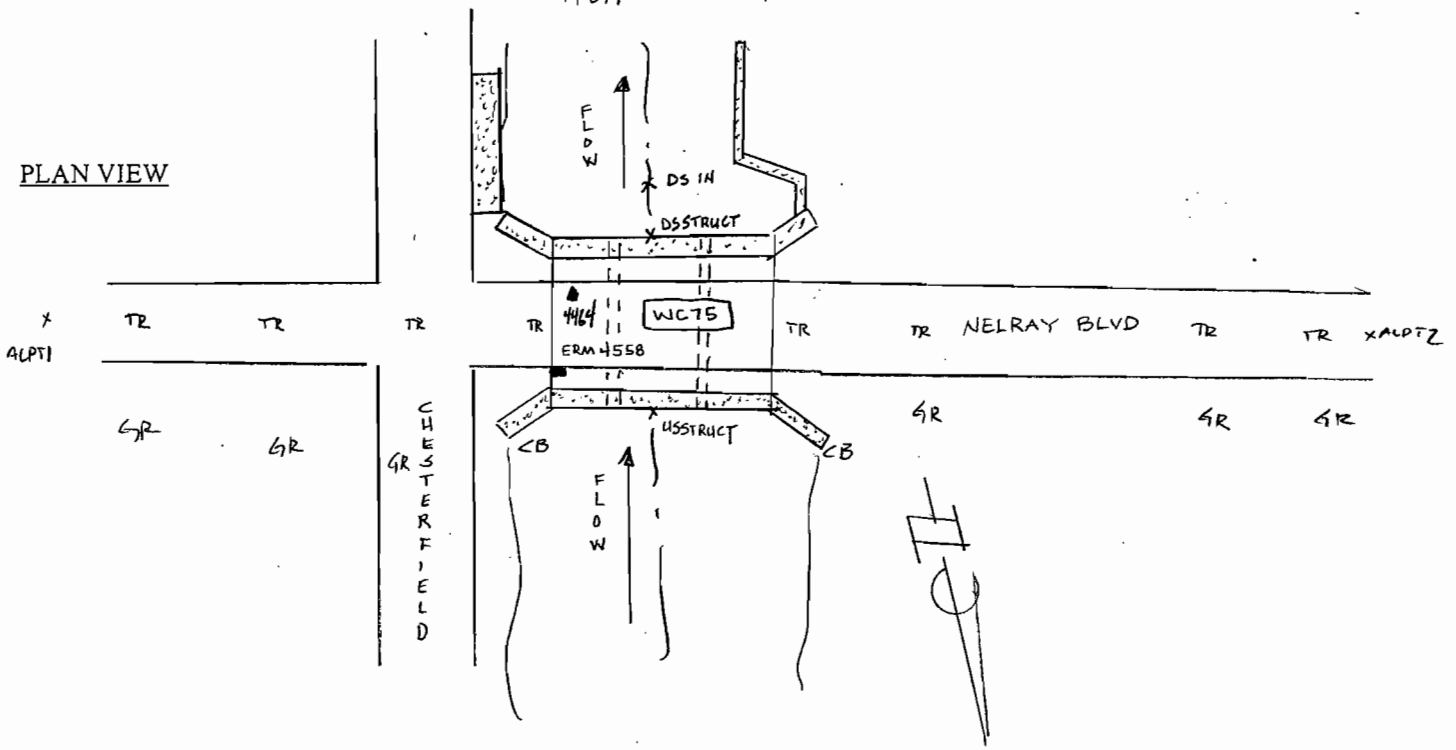
ADDL COMMENTS SHOTS 4557 - 4601

GPS PTS 4464, 4463

PROFILE VIEW



PLAN VIEW



T @ 4464 BS 4463

HI = 5.06 HT = 4.85

4557 - 4.85 CHK + 4463 ERR. 0.01 / 0.00

4601 4.85 CHK + 4463 ERR. 0.01 / 0.00

COORD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 76 BR

STREAM NAME: WALLER CREEK DATE: 12-14-07

LOCATION: W 55½ & CHESTERFIELD CREW MOSELEY COMBS EDWARDS

TYPE BR(X) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4603

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 2 @ 0,8 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: 11.0, 9.6 DS: _____

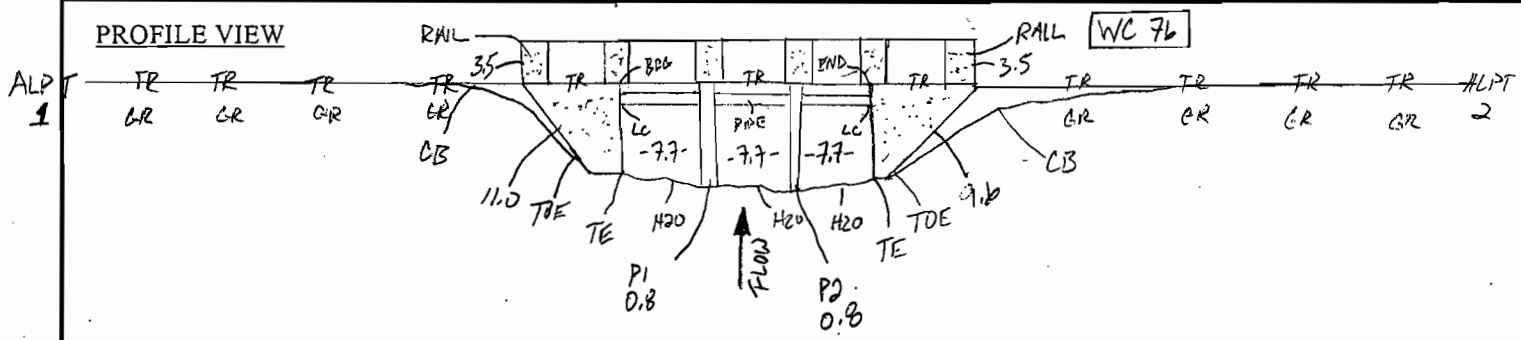
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: SQ FOUND DS LEFT ON BOC @ BEG BR.

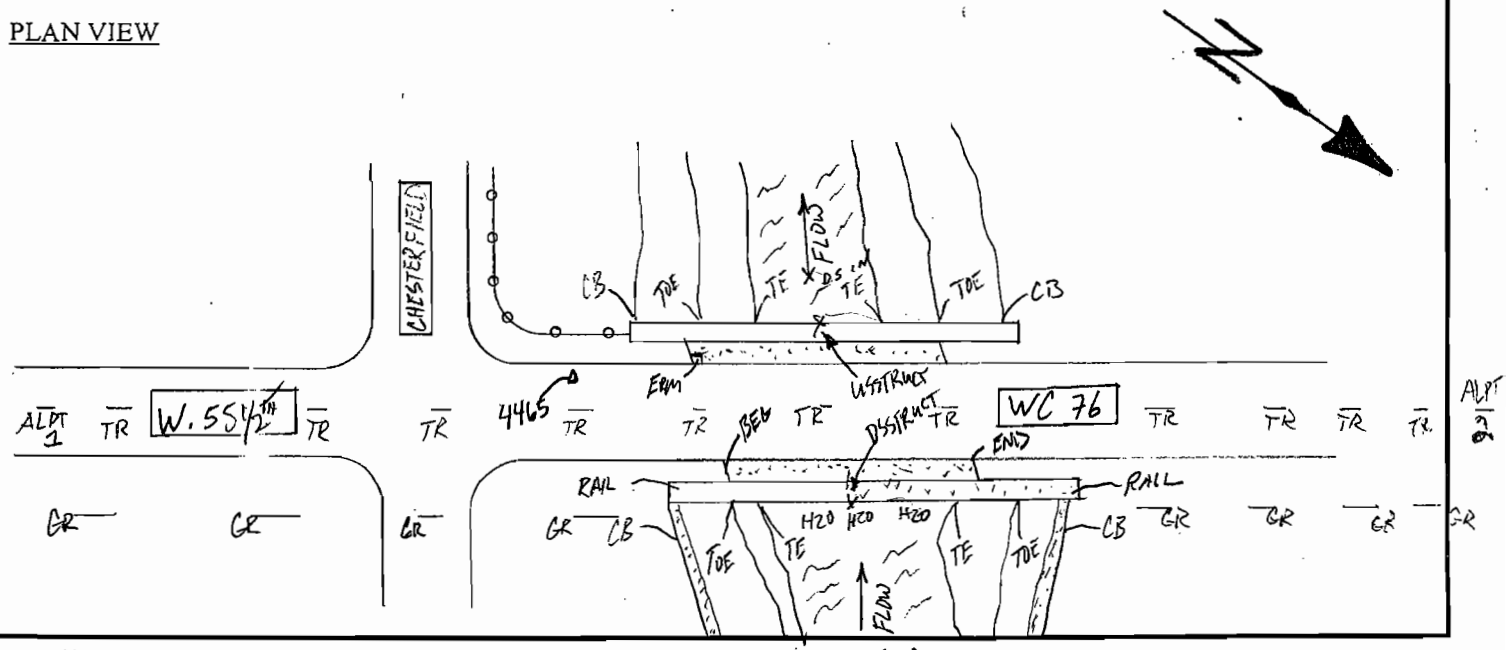
ADDL COMMENTS SHOTS - 4602 - 4646

GPS PTS 4465, 4464

PROFILE VIEW



PLAN VIEW



T@ 4465 BS@ 4464
HI 5.49 HI 5.32

4602 5.32 CHK + 4464 < ERR 0.08 0.60 >
4603 5.80 ERM BR WC 76
4646 5.32 CHK + 4464 < ERR 0.08 0.01 >

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC77

STREAM NAME: WALLER CREEK DATE: 12-14-07

LOCATION: W 55th CREW MOSELEY COMBS EDWARDS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4648

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 2 @ 0.7 PIER SHAPE SQ

CULVERT NUM# ____ SHAPE _____ LENGTH _____ SIZE H:_____ W:_____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US:_____ DS:_____

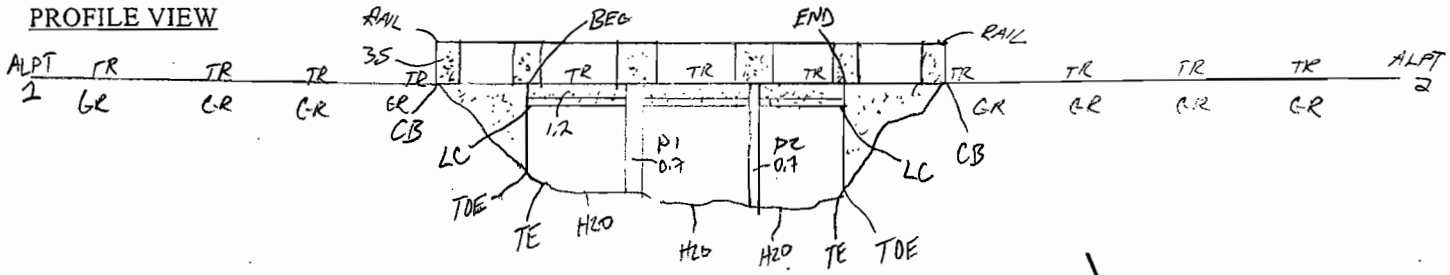
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: SQ CUT DS LEFT TOP OF DECK

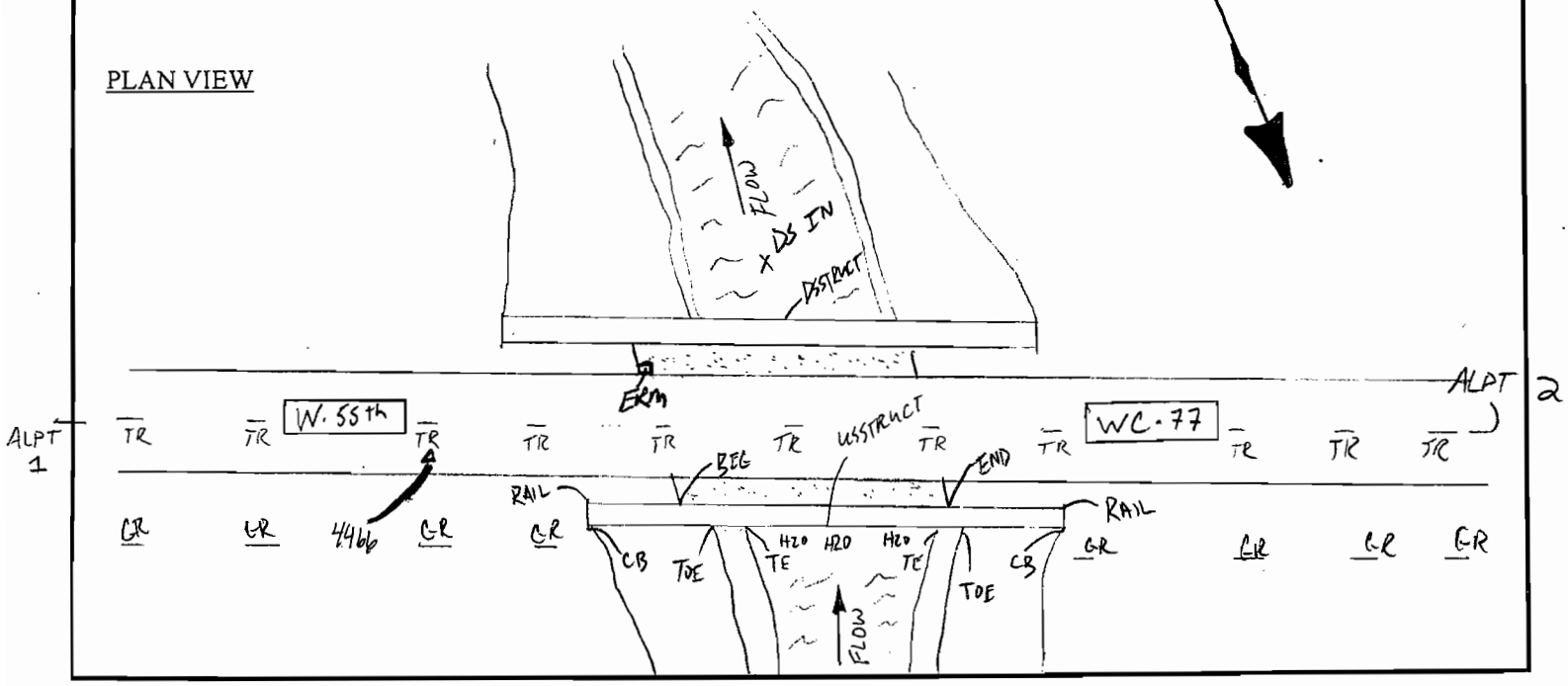
ADDL COMMENTS SHOTS 4647 - 4690

GPS PTS 4466, 4467 (shot 4686 HI IS 7.00 NOT 5.80)

PROFILE VIEW



PLAN VIEW



T @ 4466 BS 4467
5.12 5.03

4647 5.03 CHK+4467 <ERR 0.04 0.03>

4648 ERM BR WC77

4690 CHK+4467 5.03 <ERR 0.04 0.04>

COOP.

PROJECT: Waller Creek Flood Study STRUCTURE NAME WC78

STREAM NAME: Waller Creek DATE: 12-17-07

LOCATION: Koenig Ln. CREW Moseley Brooks Thomason

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4704

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) 2 @ 2.0 PIER SHAPE sq

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

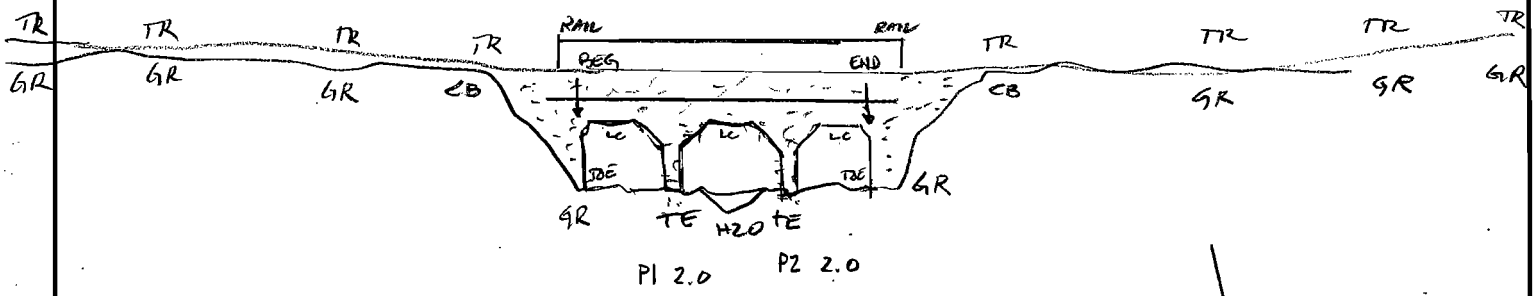
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "d" cut on US left top CRB at 4704

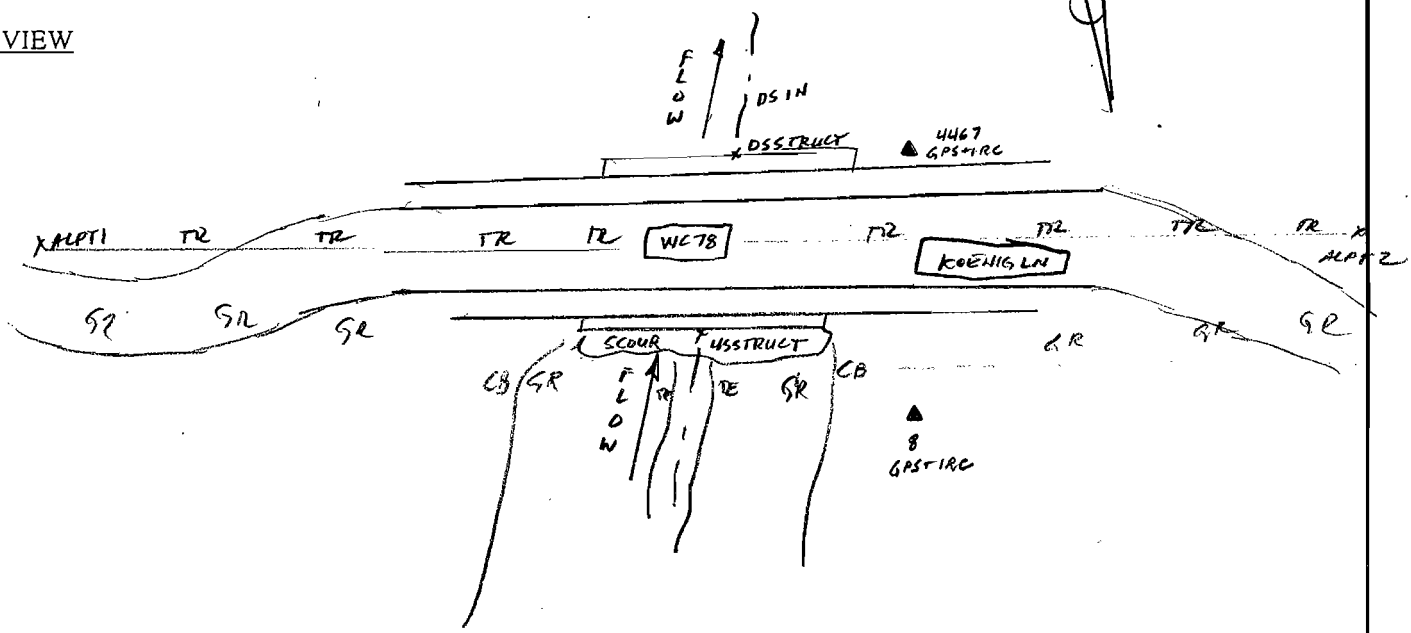
ADDL COMMENTS Shots 4702 - 4747

GPS pts 4467, 4466

PROFILE VIEW



PLAN VIEW



T @ 4467 BS 4466 4747 5.52 CHK+4466 <ERR. 0.02, 0.07>

HI = 5.36 HT = 5.52

4702 5.52 CHK+4466 0.02, 0.08

4703 5.3 CHK+8 0.21, 0.009

4704

GOOP

1 of 2

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC 79

STREAM NAME: WALLER CREEK DATE: 12-17-07

LOCATION: SKYVIEW CREW MOSELEY BROOKS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4749

BRIDGE RAIL 4.0 DECK 0.6 WIDTH 6.5 PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

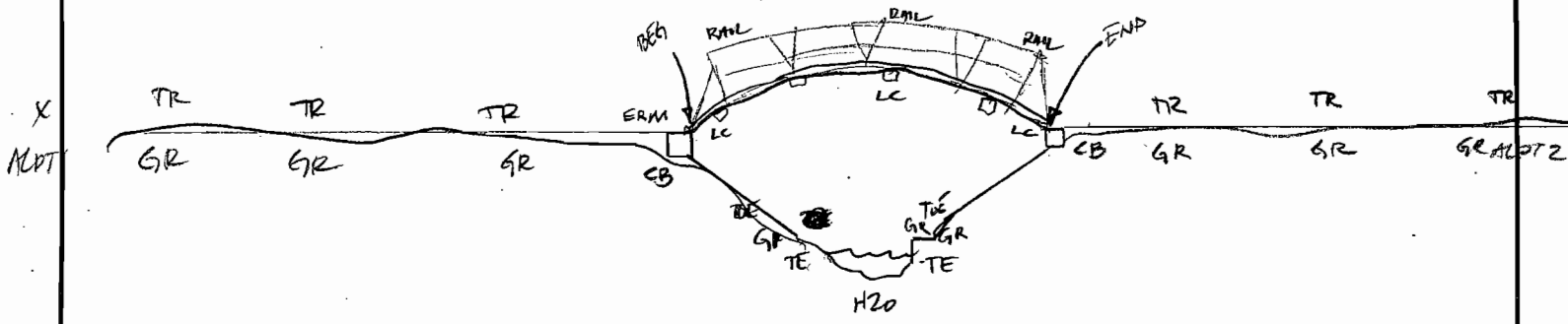
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US LEFT TOP ABUT #4749

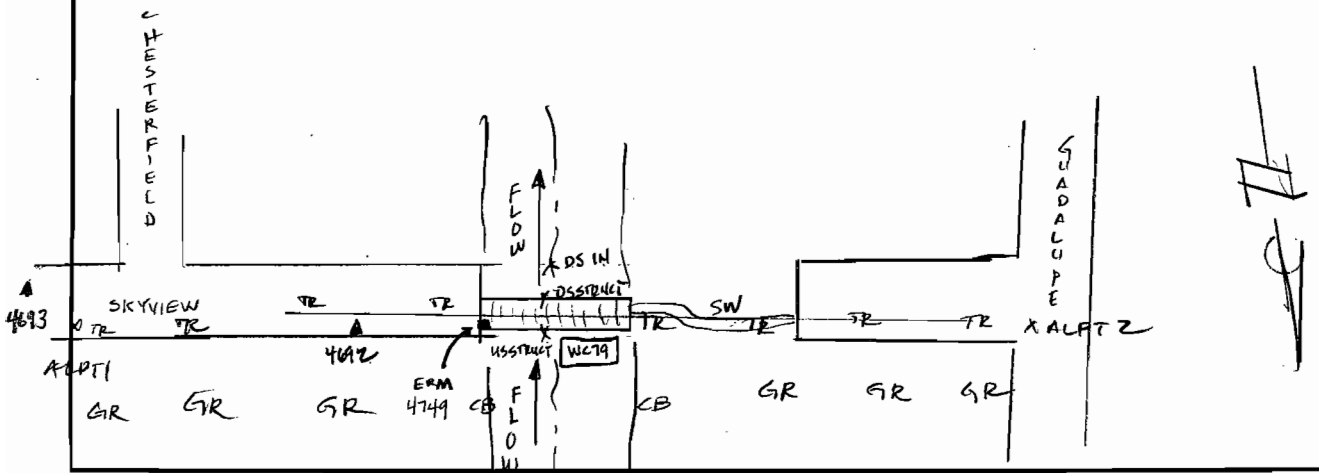
ADDL COMMENTS SHOTS 4748-4795 PED BRIDGE

GPS PTS. 4692 / 4693

PROFILE VIEW



PLAN VIEW



T @ 4692 BS 4693
HI = 5.49 HT = 5.44

4748 5.44 CHK = 4693 ⟨0.06 / 0.07⟩
4749 ERM

4795 5.44 CHK = 4693 ⟨ERR. 0.06 / 0.07⟩

GOOD

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WC80

STREAM NAME: WALLER CREEK DATE: 12-18-07

LOCATION: DS of DENSON ; US of SKYVIEW CREW MOSELEY COMBS THOMPSON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID _____

BRIDGE RAIL — DECK _____ WIDTH 1.0 PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

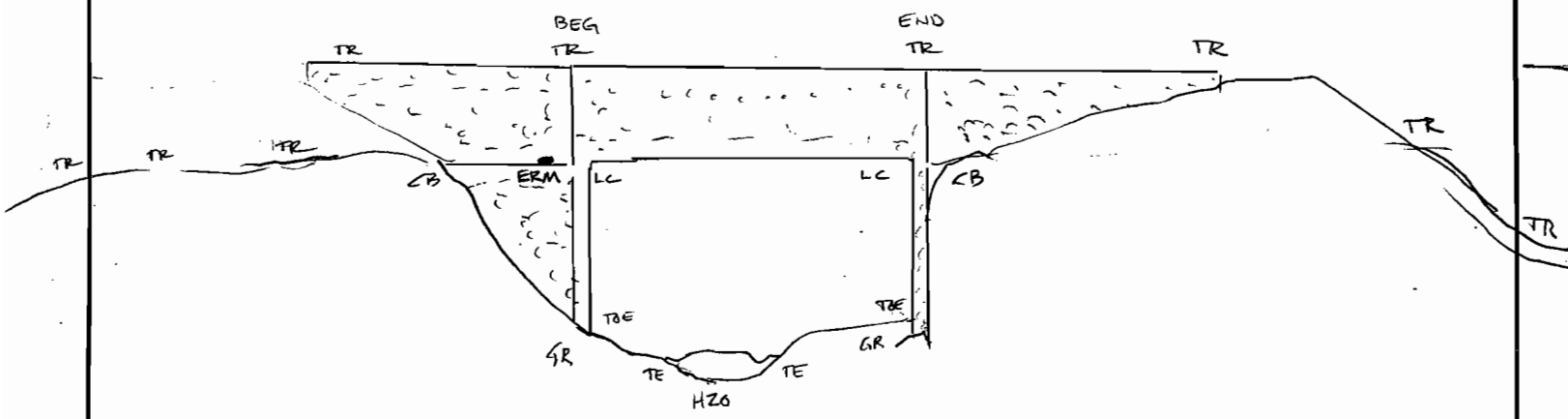
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: ☐ CUT ON US LEFT WINGWALL @ BEG BR

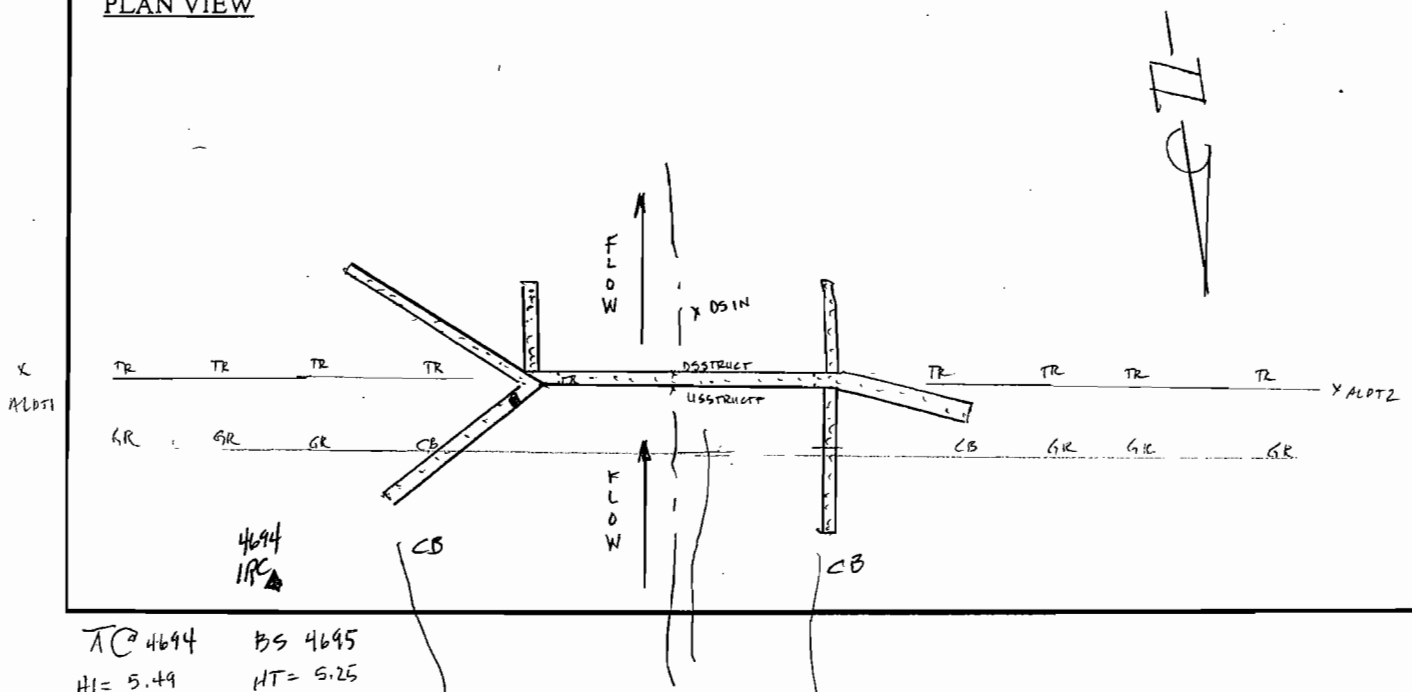
ADDL COMMENTS SHOTS 4796-4837 1.0 WIDE CONC. RET WALL (DAM)

GPS PTS 4694 4695 @ RET POND SW CR

PROFILE VIEW



PLAN VIEW



BC @ 4694 BS 4695

HI = 5.49 HT = 5.25

4796 5.25 CHK = 4695 (ERR. 0.07 0.05)

~~4797~~ 5.25 CHK = 4695 (ERR. 0.07 0.05)

4837

PROJECT: Waller Creek Flood Study STRUCTURE NAME CUL WC81

STREAM NAME: Waller Creek DATE: 12-18-07

LOCATION: Denson Dr. CREW Moseley Combs Thomason

TYPE BR ( ) CUL (✓) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4839

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# 4 SHAPE Box LENGTH _____ SIZE H: 6.5 W: ~~8.0~~ 7.0 SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: 9.0 DS: 9.0

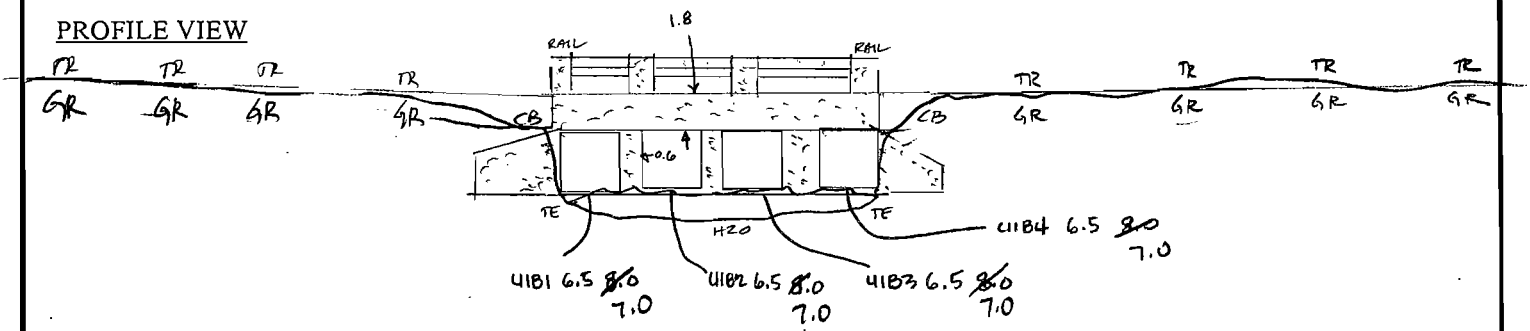
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: COA BRASS DISC END @ DS LEFT Top Deck +/- 3' W of D1B1

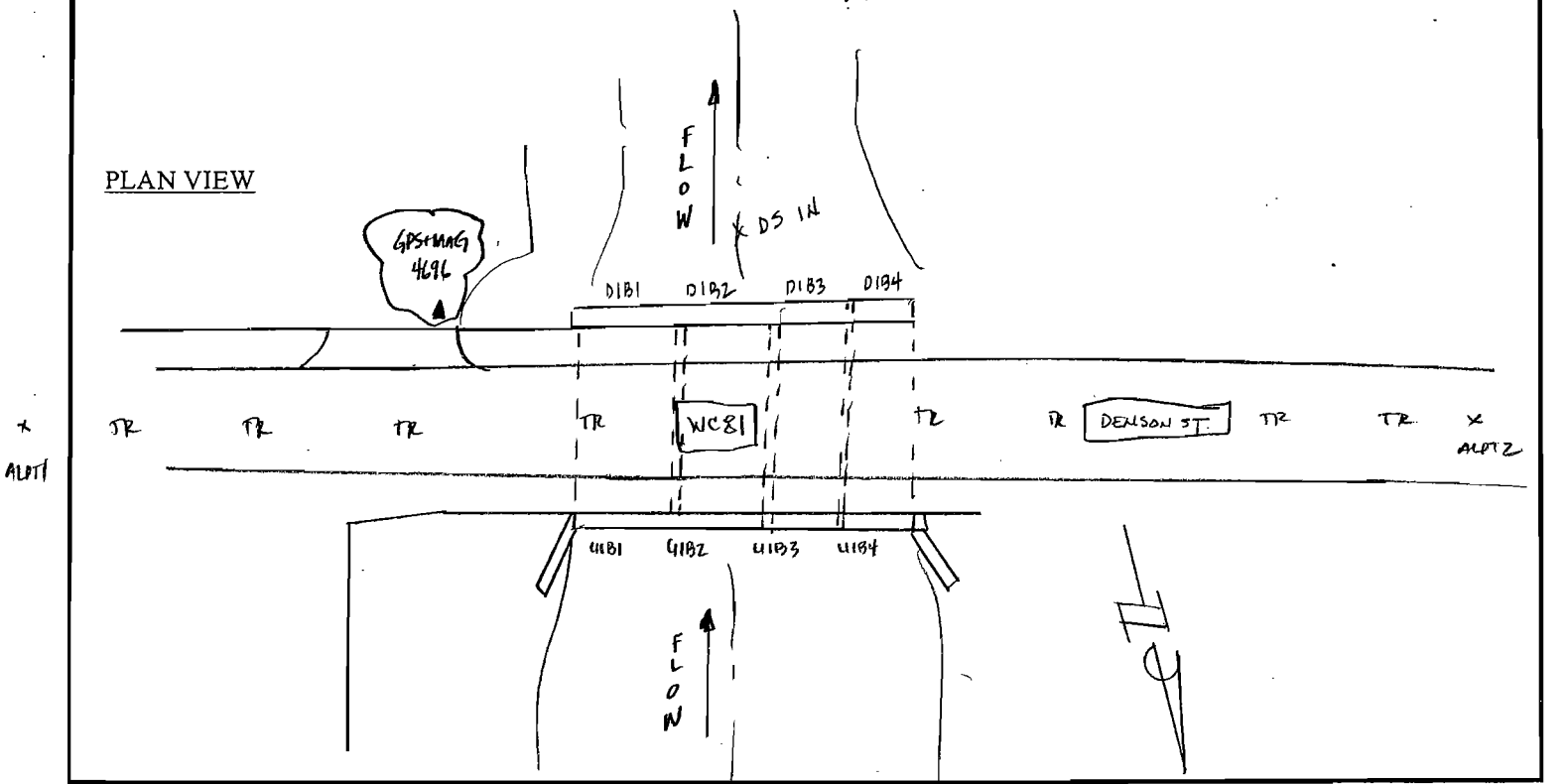
ADDL COMMENTS Shots 4838 - 4883

GPS Pts 4695, 4696

PROFILE VIEW



PLAN VIEW



T @ 4696 BS 4695

HI = 5.51 HT = 5.25

4838 5.25 CHK + 4695 ⟨ERR. 0.05 / 0.13⟩

4883 CHK + 4695 ⟨ERR. 0.06 / 0.11⟩

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME BR WC82

STREAM NAME: WALLER CREEK DATE: 12-19-07

LOCATION: 1ST STRUCTURE (RR BRIDGE) DS OF AIRPORT CREW MOSELEY COMBS

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4885

BRIDGE RAIL — DECK _____ WIDTH 8.0 PIER(s) 2 @ 1.0 PIER SHAPE SQ

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

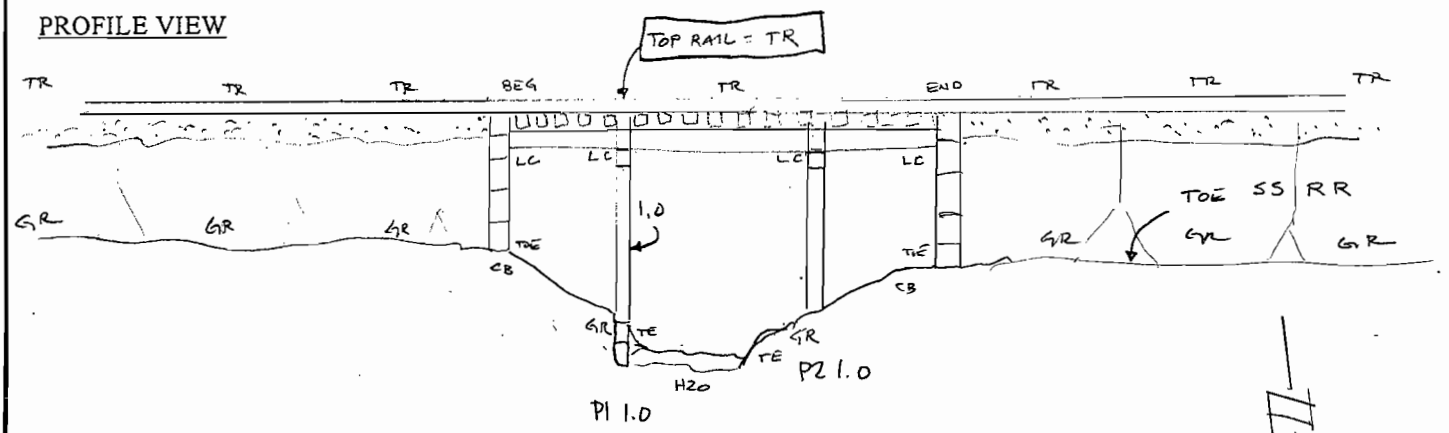
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: MAG NAIL SET IN US LEFT TOP ABUTMENT @ TRACK

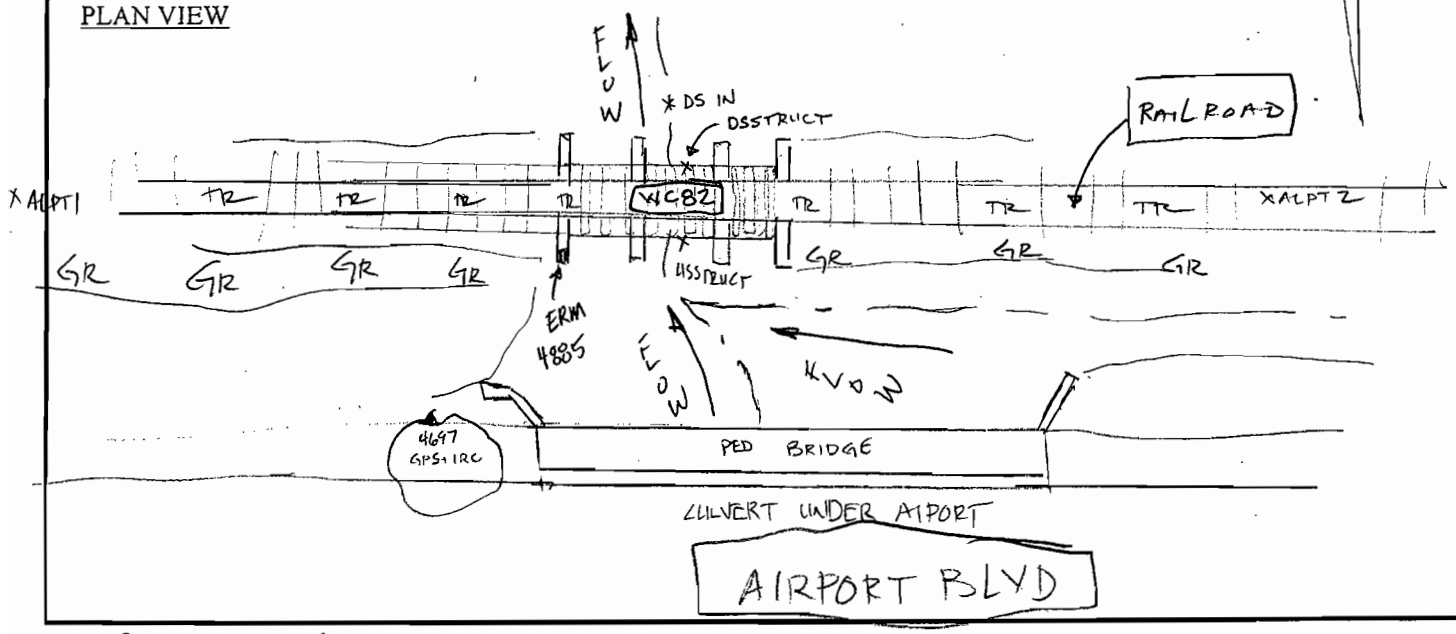
ADDL COMMENTS SHOTS 4884 - 4929 RAIL ROAD BRIDGE @ AIRPORT / WALLER

GPS PTS 4697 / 4698 1ST STRUCTURE DOWNSTREAM OF AIRPORT

PROFILE VIEW



PLAN VIEW



T @ 4697 BS 4698

HI = 5.32 HT = 5.44

4484 5.44 CHK = 4698 (ERR 0.07 0.02)

4929 5.44 CHK + 4698 (ERR 0.07 0.01)

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-1

STREAM NAME: WALLER CREEK TRIB 1 DATE: 11-08-07

LOCATION: DEAN KEETON CREW MOSELEY COMBS THOMASON

TYPE BR( ) CUL( ) DAM( ) XS( ) ERM ELEV ERM ID 2953

BRIDGE RAIL ____ DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

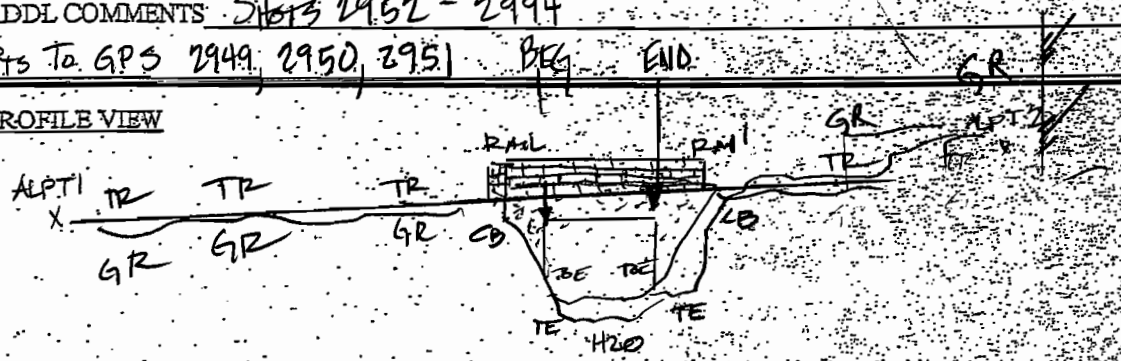
DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

ERM DESCRIPTION: UT DISC UT34 US E SW WCT1-1 #2953

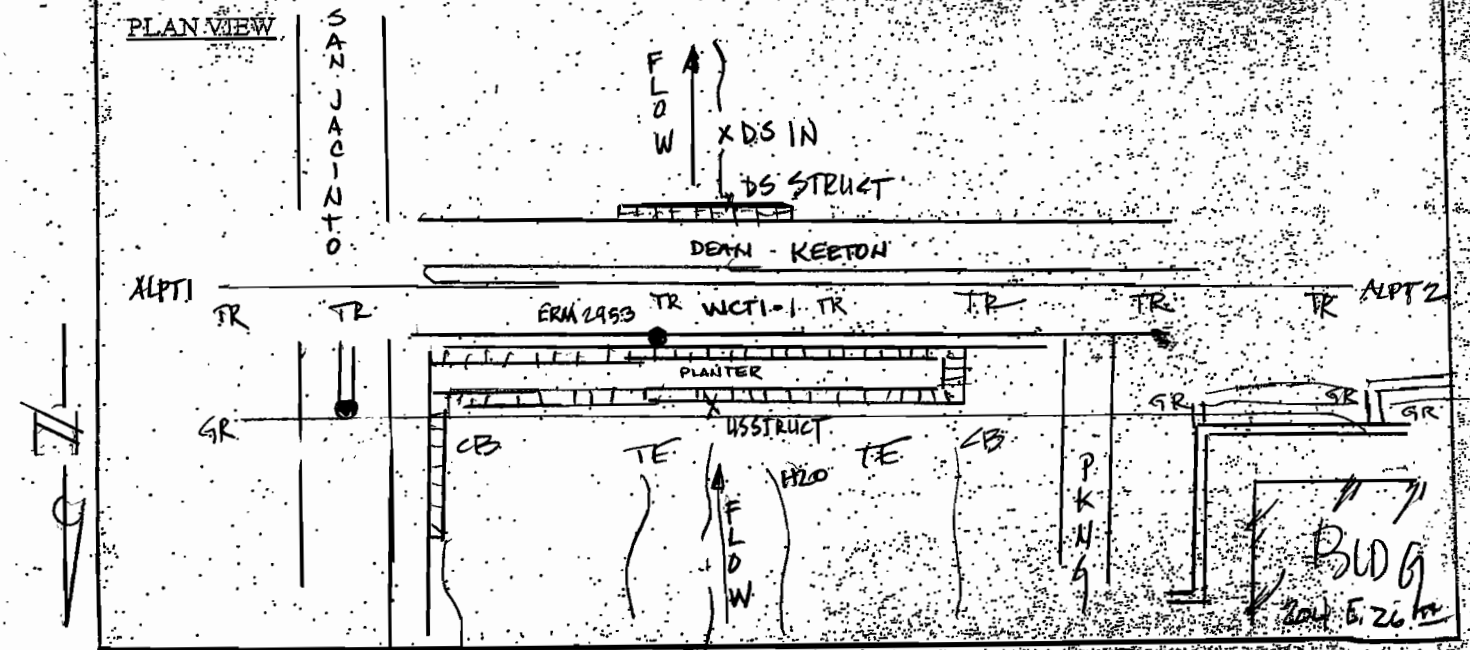
ADDL COMMENTS ~~SHOTS~~ 2952 - 2994

PTS TO GPS 2949, 2950, 2951 BEG END

PROFILE VIEW



PLAN VIEW



@ 2949 BS 2950
HI = 5.46 HT = 5.30
2952 5.30 CHK + 2950 (ERR 0.00 0.00)
2953
2994 CHK + 2950 (ERR 0.00 0.00)

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-2 PL XING

STREAM NAME: WALLER CREEK TRIB I DATE: 11-08-07

LOCATION: PL XING US OF DEAN KEETON CREW MOSELEY

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 2997

BRIDGE RAIL ____ DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

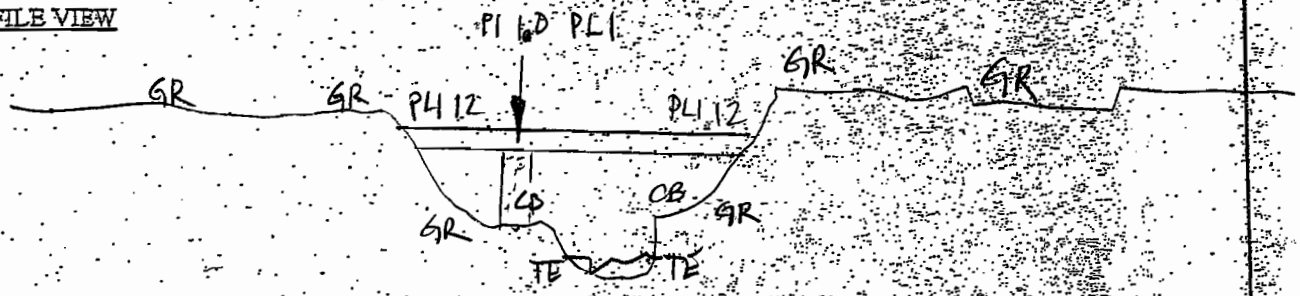
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

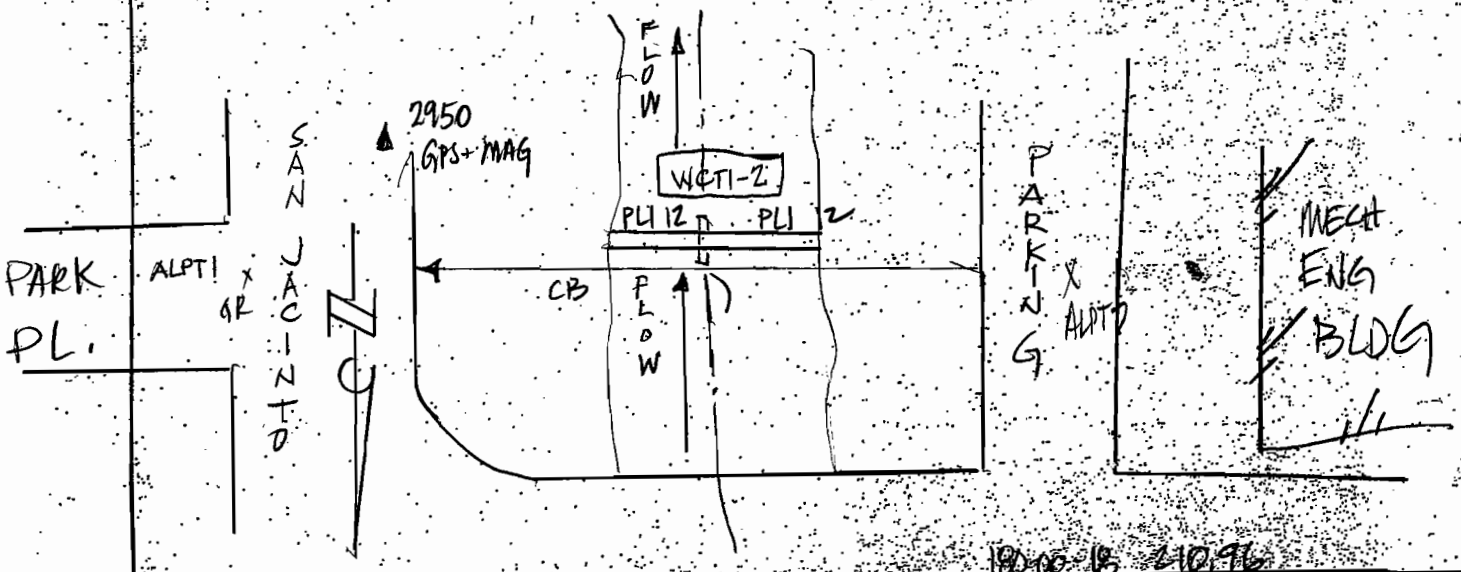
ERM DESCRIPTION: ☐ CUT ON BACK CRB W. SIDE SAN JACINTO @ ER SERVICE RD

ADDL COMMENTS SHOTS 2995 – 3017 BETWEEN DEAN KEETON & MECH ENG BLDG SER. ENT. PL "X"ING

PROFILE VIEW



PLAN VIEW



18-00-18 210.96

TC @ 2950 BS 2949

HI = 5.58 HT = 5.31

2995 5.31 CHK + 2949 ERR 0.00 0.01

2996 CHK + 2951 ERR 0.00 0.02

00-00-00

2951 68-00-50 162.52

348-01-14 162.52

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-3

STREAM NAME: WALLER CREEK TRIB 1 DATE: 11-08-07

LOCATION: SERVICE RD. TO MECH. ENG. BLD & CHILLER #5 CREW MOSELEY COMBS THOMASON

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV ERM ID 3019

BRIDGE RAIL ____ DECK ____ WIDTH ____ PIER(s) ____ @ ____ PIER SHAPE ____

CULVERT NUM# ____ SHAPE ____ LENGTH ____ SIZE H: ____ W: ____ SKEW ____

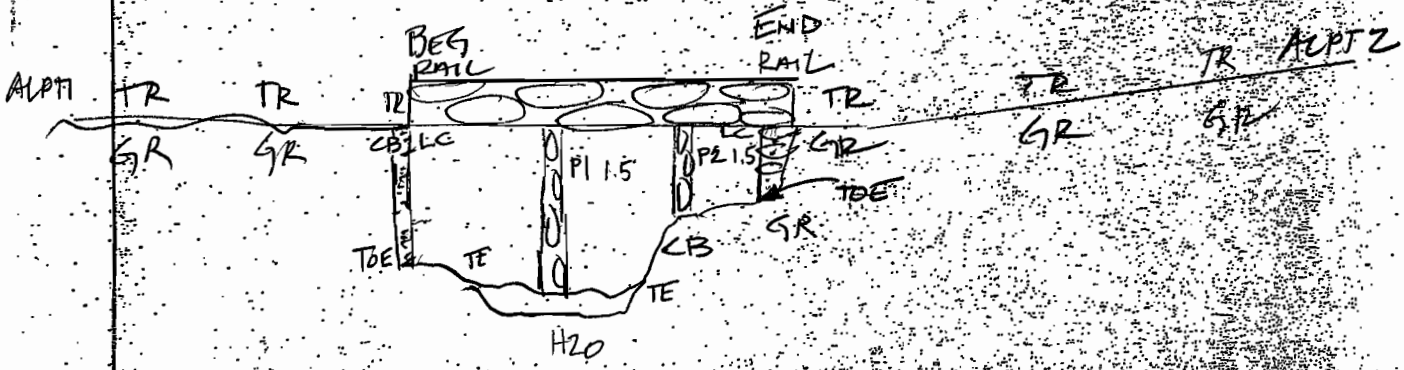
CULVERT I/O TYPE ____ MATERIAL ____ WINGWALL US: ____ DS: ____

DAM TOP WIDTH ____ SIDE SLOPE US ____ DS ____ RISER ____ x ____ SPY# ____

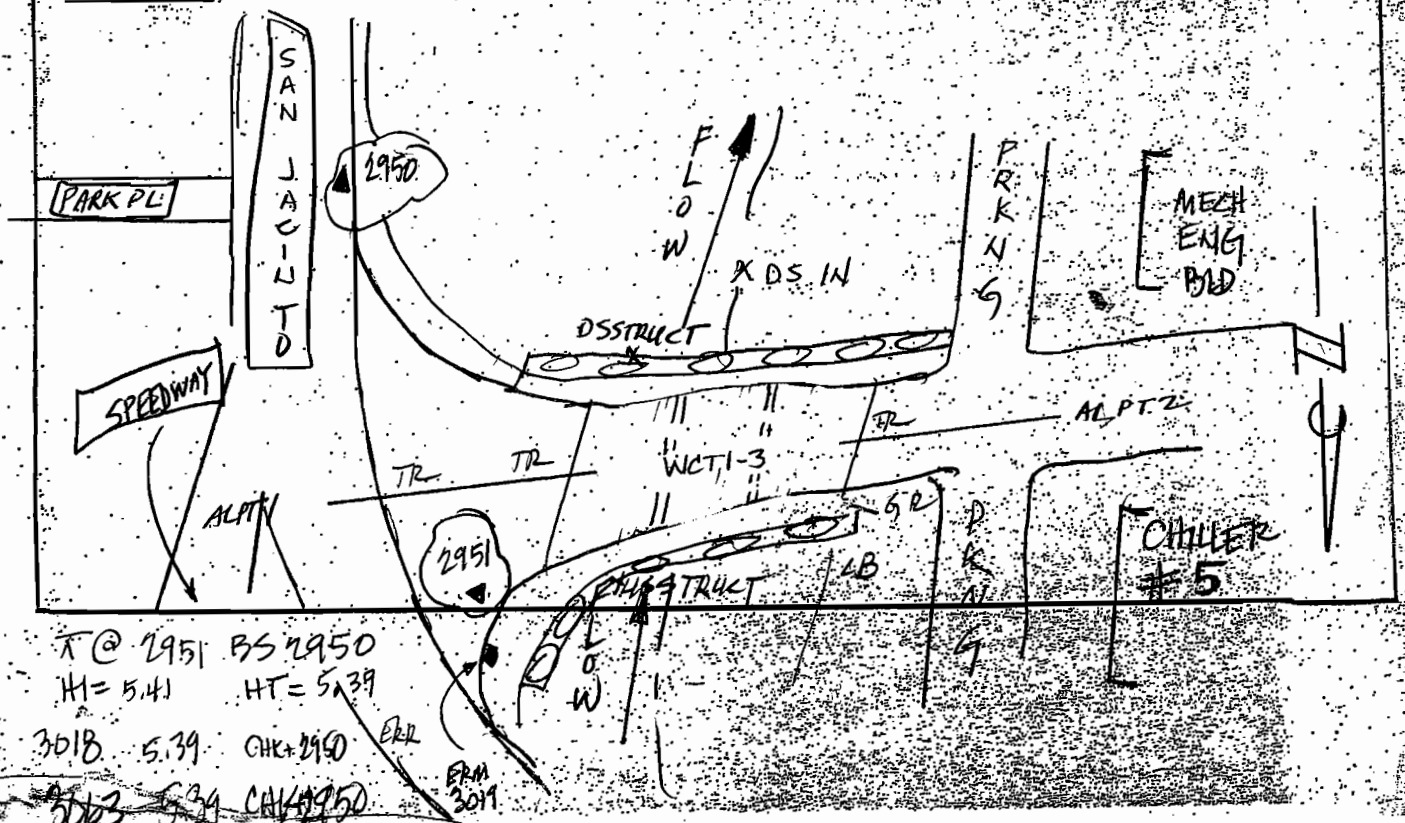
ERM DESCRIPTION: "□" CUT ON CRB US @ MP CRB RET

ADDL COMMENTS 3018 – 3063

PROFILE VIEW



PLAN VIEW



T @ 2951 BS 2950
HI = 5.41 HT = 5.39
3018 5.39 CHK 2950
3063 5.34 CHK 2950

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-4

STREAM NAME: WALLER CREEK TRIB 1 DATE: 12-20-07

LOCATION: JUST WEST OF INT. SAN JACINTO & DUVAL 3RD STRUCTURE DS of Speedway CREW MOSELEY

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4967

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

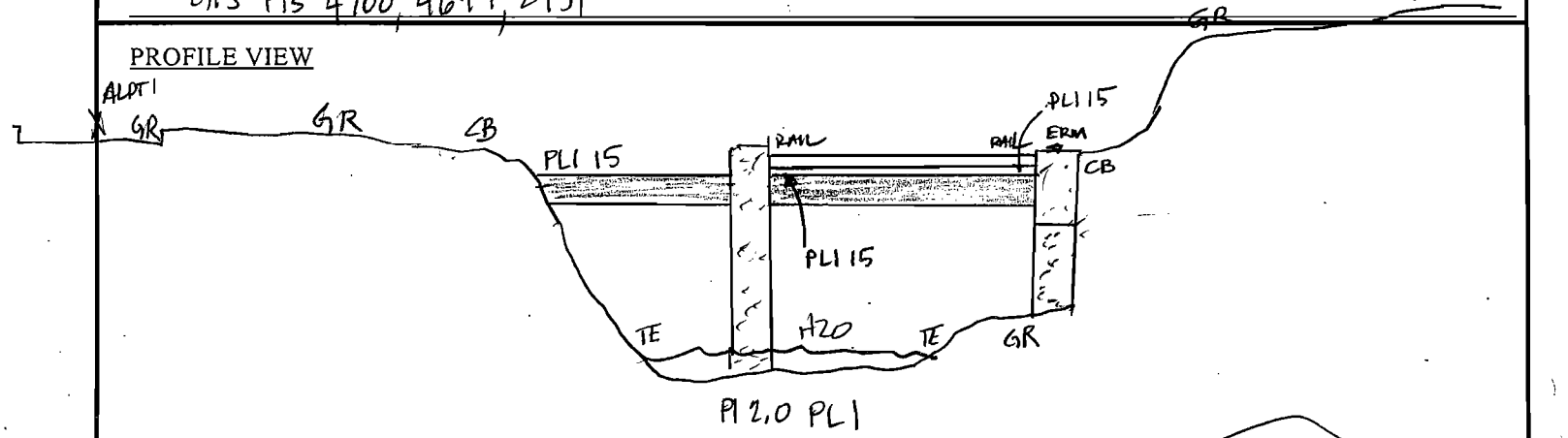
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US RIGHT TOP ABUT

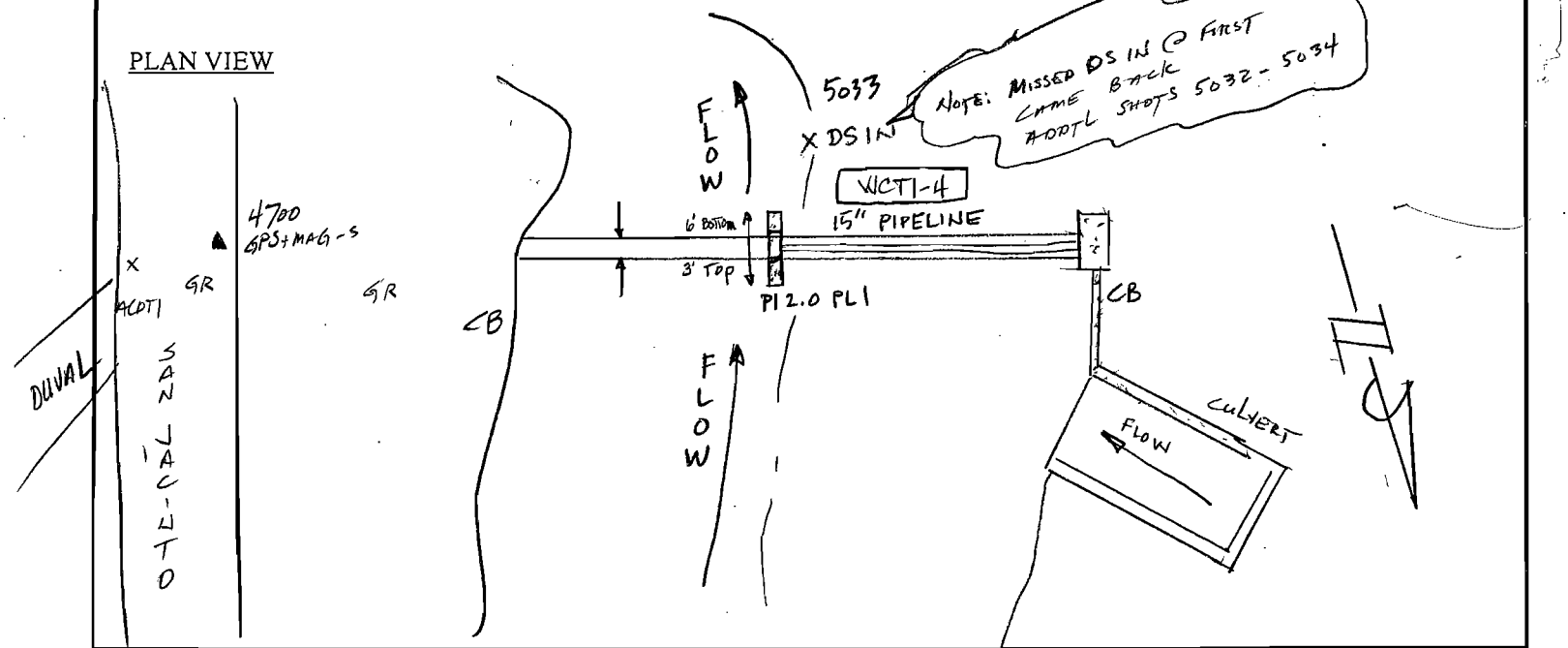
ADDL COMMENTS SHOTS 4966-4988 PIPELINE "X"ING SHOTS 5032-5034

GPS PTS 4700, 4699, 2951

PROFILE VIEW



PLAN VIEW



T@4700 BS 4699

HI = 5.52 HT = 5.35

4966 5.35 CHK+ 4699 ⟨ERR. 0.02, 0.11⟩

4967

4988 5.35 CHK+4699 ⟨ERR .03, .10⟩

T@4700, BS 4699

HI = 5.52 HT = 5.23

5032 5.23 CHK+4699 ⟨ERR. 0.04, 0.08⟩

5033 17.3 DS IN

5034 5.23 CHK+4699 ⟨ERR. 0.04, 0.09⟩

PROJECT: Waller Creek Flood Study STRUCTURE NAME WCTI-05

STREAM NAME: Waller Creek Trib 1 DATE: 12-20-07

LOCATION: 2ND Structure DS of Speedway CREW Moseley Combs Thomson

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 4990

BRIDGE RAIL 3.0 DECK 2.0 WIDTH 5.0 PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

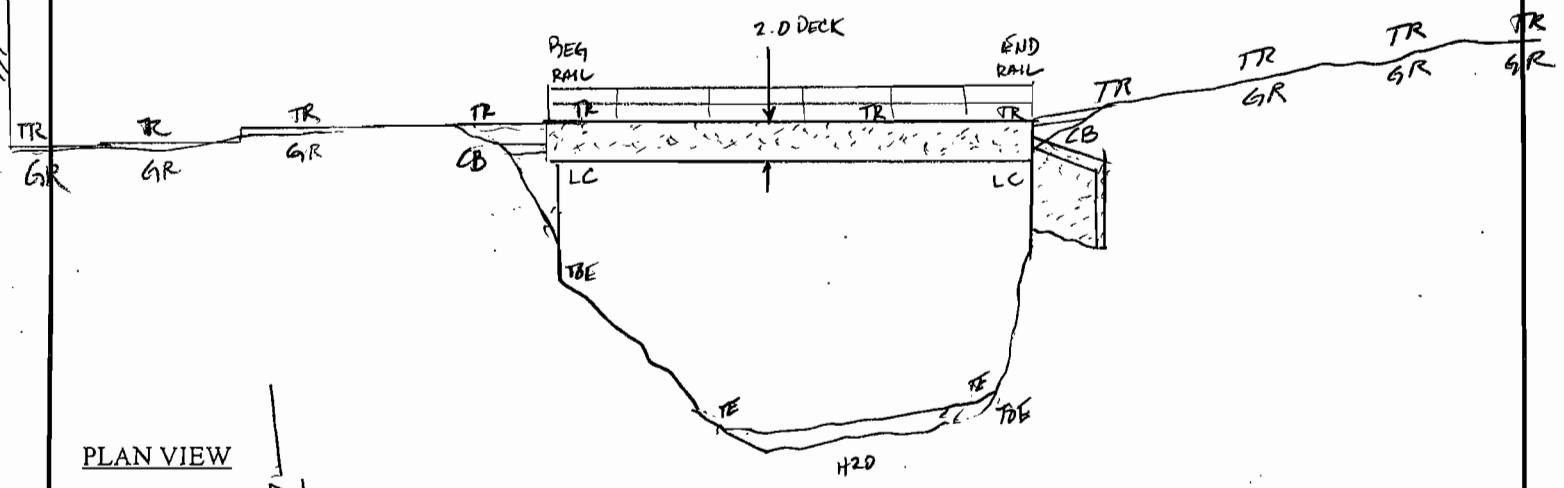
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "□" CUT ON US LEFT Top WINGWALL @ MIDPOINT

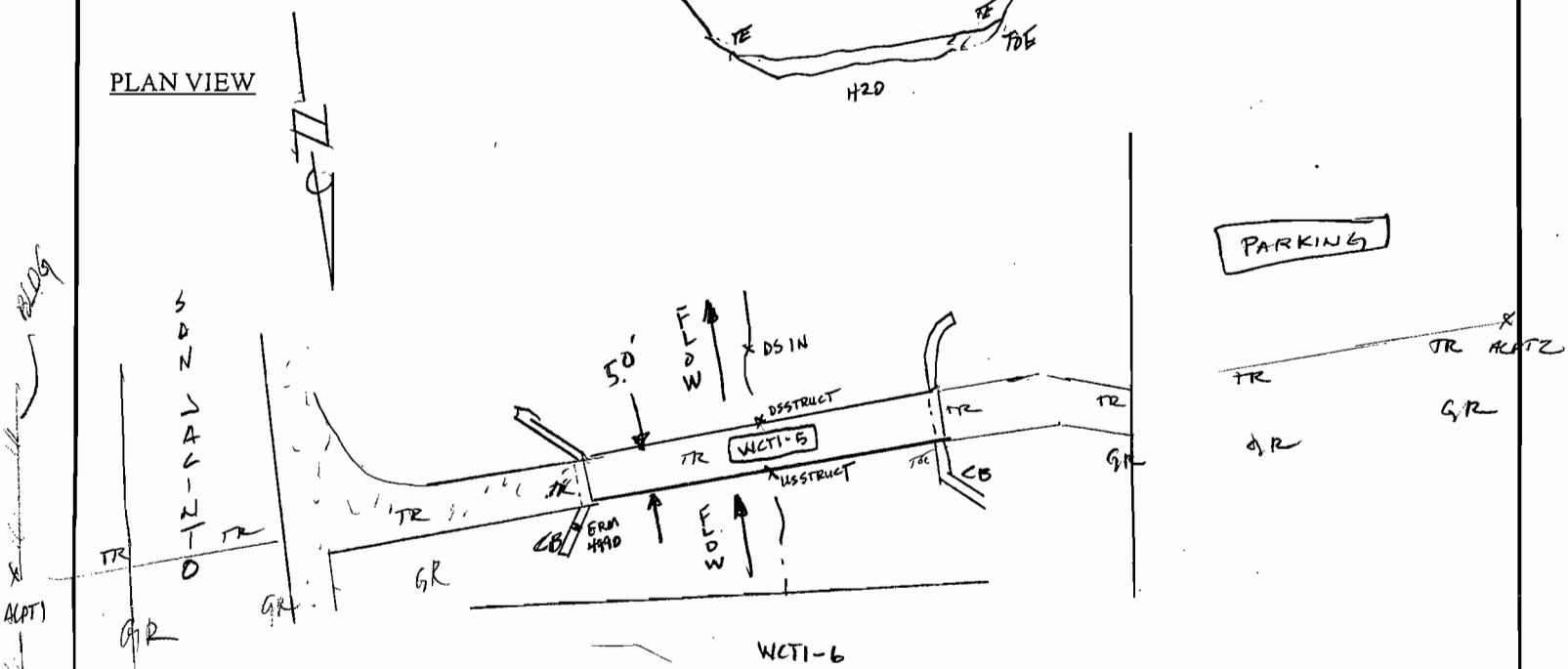
ADDL COMMENTS Shots 4989 - 5031

GPS Pts 4699, 4700

PROFILE VIEW



PLAN VIEW



TC @ 4699 BS 4700
HI=5.46 HT=5.40
4989 5.40 CHK+4700 ⟨0.03 / 0.13⟩
5031 5.40 CHK+4760 ⟨0.05 / 0.14⟩

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-06

STREAM NAME: WALLER CREEK TRIB 1 DATE: 12-21-07

LOCATION: 1ST STRUCTURE DS OF SPEEDWAY (RESTRICTED PKNG ACCESS) CREW MOSELEY COMBS THOMASON

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5036

BRIDGE RAIL 3.7 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

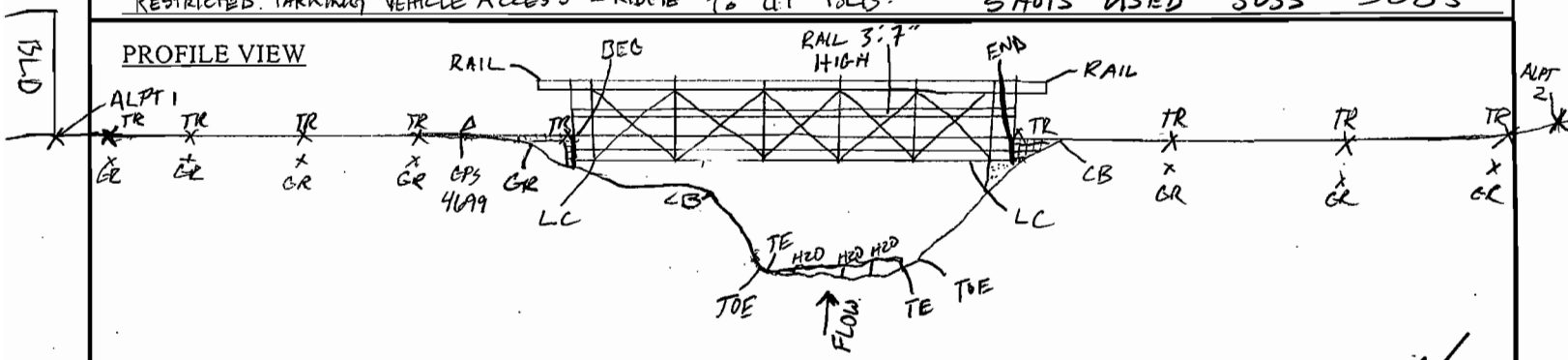
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: SQ "CUT" ON HS LFT TOP DECK @ SW

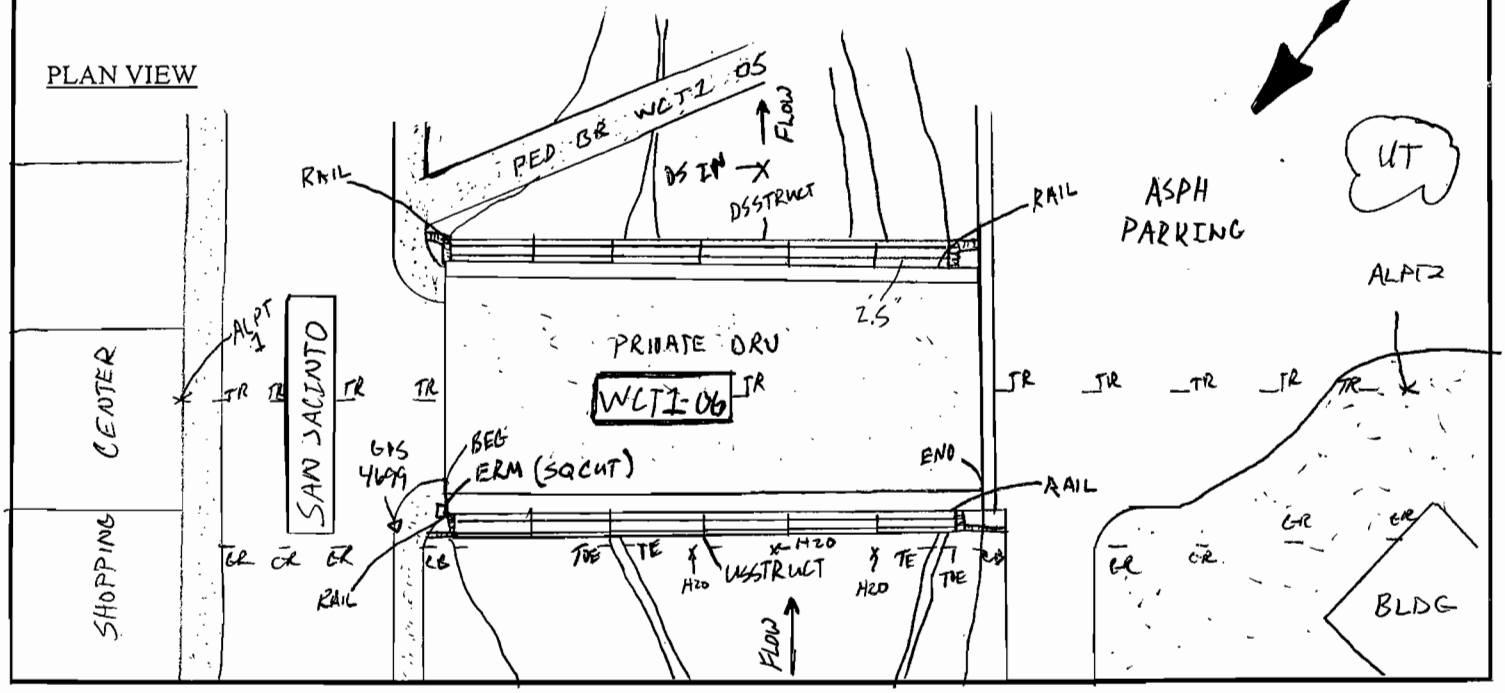
ADDL COMMENTS NEW DC FILE "WALLER CREEK T1" GPS PTS 4699, 4700

RESTRICTED PARKING VEHICLE ACCESS BRIDGE TO UT BLD. SHOTS USED 5035 - 5083

PROFILE VIEW



PLAN VIEW



T @ 4699 BS 4700

HI = 5.16 HT = 5.69

5035	5.69	CHK + 4700	< ERR	0.02 0.10 >
5083	5.69	CHK + 4700	< ERR	0.03 0.11 >

PROJECT: Waller Creek Flood Study STRUCTURE NAME WCT1-07-PL

STREAM NAME: Waller Creek Trib 1 DATE: 02-01-08

LOCATION: 1st Structure +/- 75' DS of Speedway CREW Moseley Combs Edwards

TYPE BR ( ) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5632

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

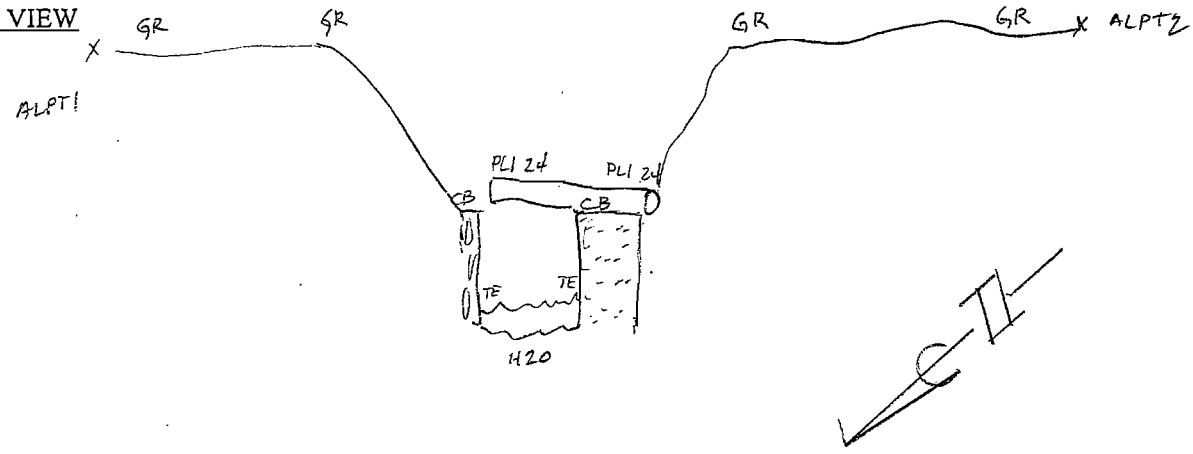
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

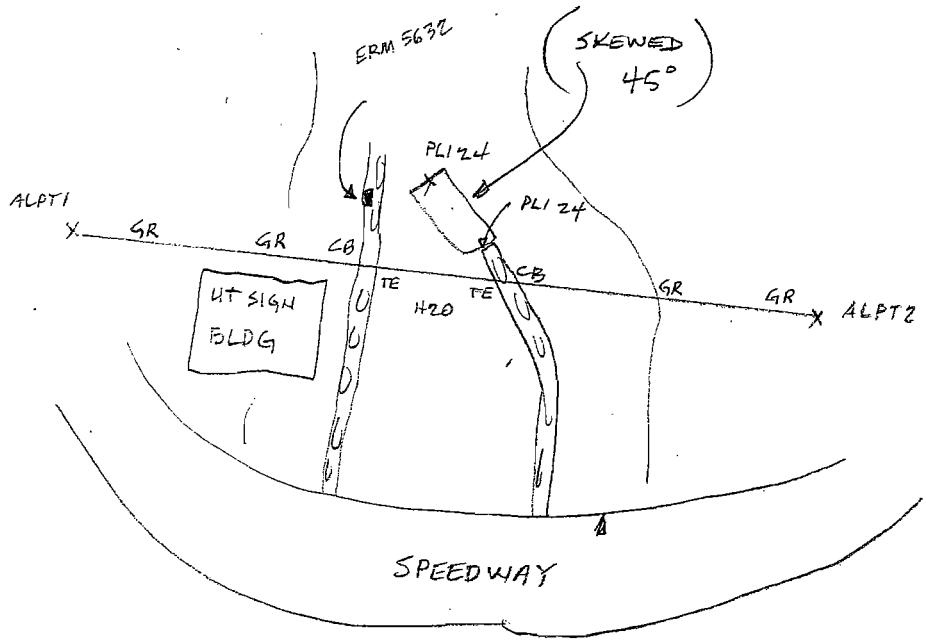
ERM DESCRIPTION: Note: ERM not shot 1st # 5632 "D" cut on Top Wall @ CB (US Left)

ADDL COMMENTS Shots 5620 - 5636 24" Pipeline Xing (Abandoned)

PROFILE VIEW



PLAN VIEW



TA @ 5536 BS 5384

HI = 5.49 HT = 9.47

5620 ALPT1

5637 9.47 CHK + 5384

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCTI-08

STREAM NAME: WALLER CREEK TRIB 1 DATE: 02-01-08

LOCATION: SPEEDWAY CREW MOSELEY

TYPE BR (Y) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5578

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) ⌐ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

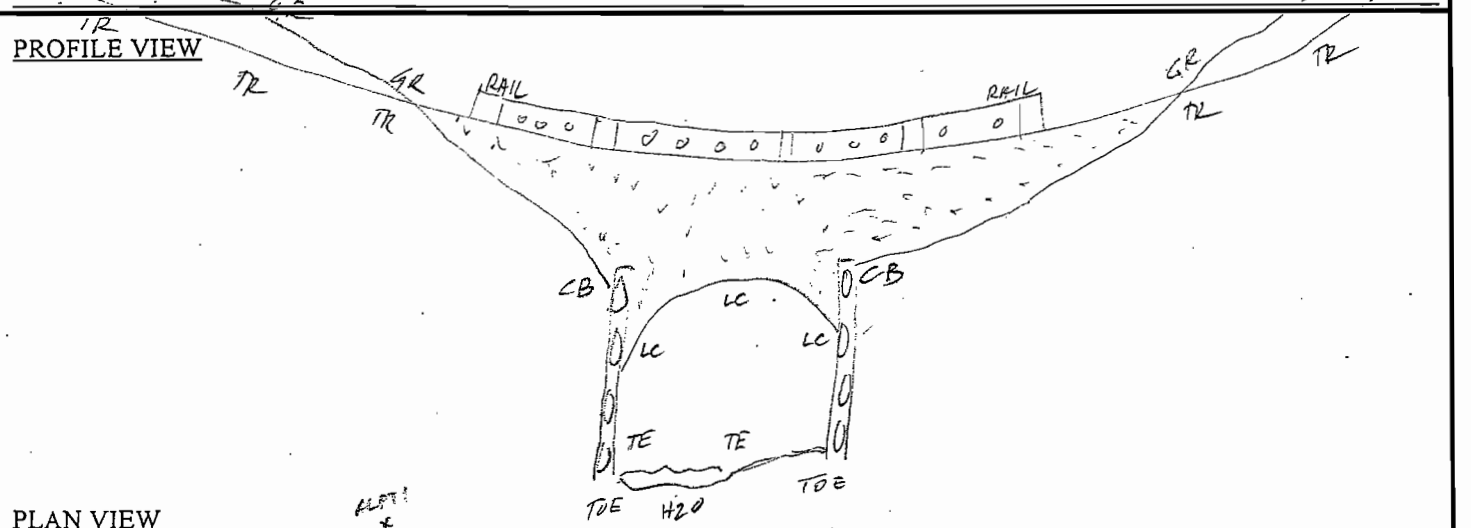
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

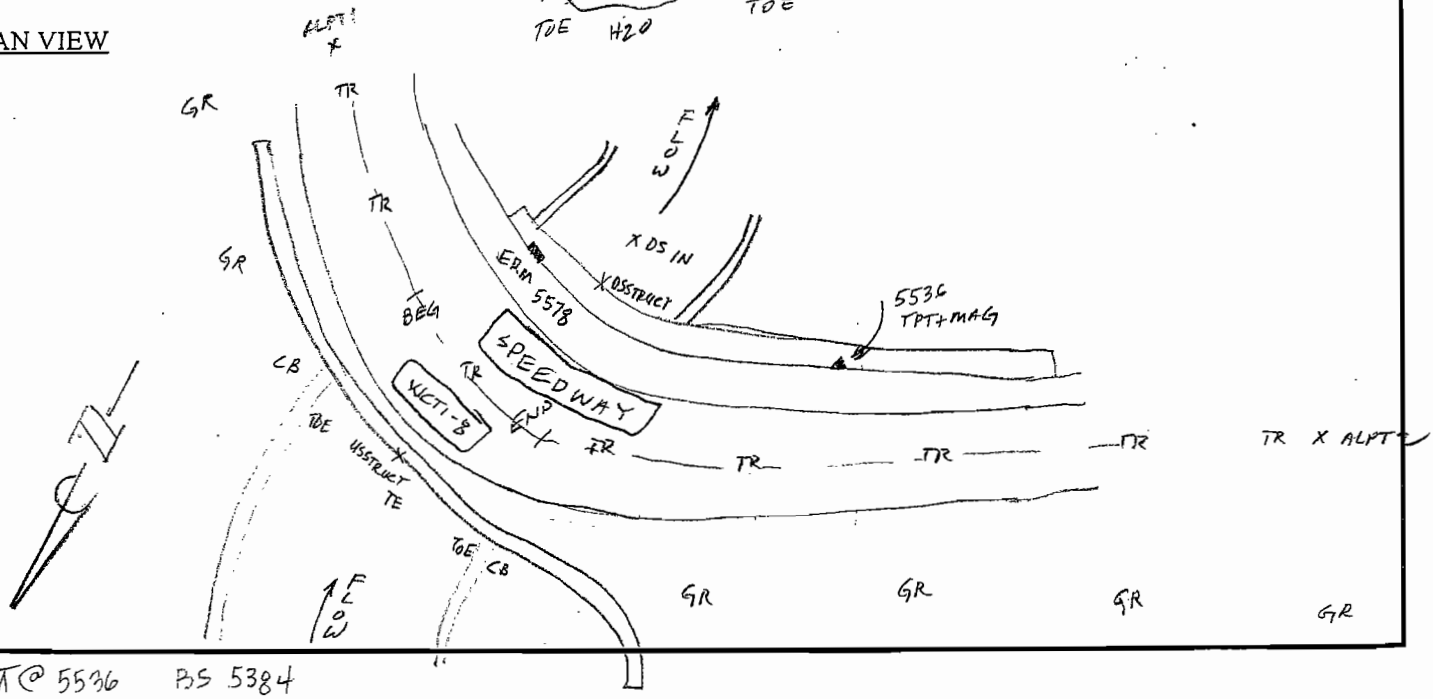
ERM DESCRIPTION: "□" SET DS BEG @ TOP CRB SW

ADDL COMMENTS SHOTS 5578 – 5619

PROFILE VIEW



PLAN VIEW



T@ 5536 BS 5384

HI = 5.49 HT = 9.48

5577 9.48 CHK + 5384 <ERR 0.03 / 0.02>

5619

5632

PROJECT: Waller Creek Flood Study STRUCTURE NAME WCT1-09

STREAM NAME: Waller Creek Trib 1 DATE: 02-01-08

LOCATION: Patio Deck US of Speedway @ Seminary CREW Moseley Combs

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5539

BRIDGE RAIL 3.0" DECK 0.60 WIDTH _____ PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

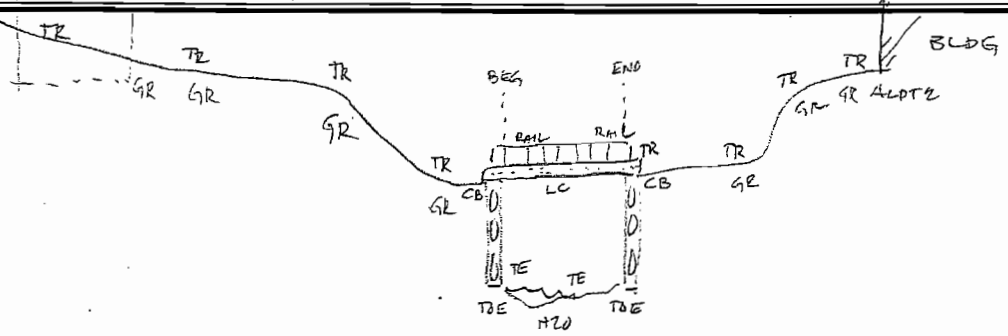
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: ☐ CUT ON US RIGHT Top Deck

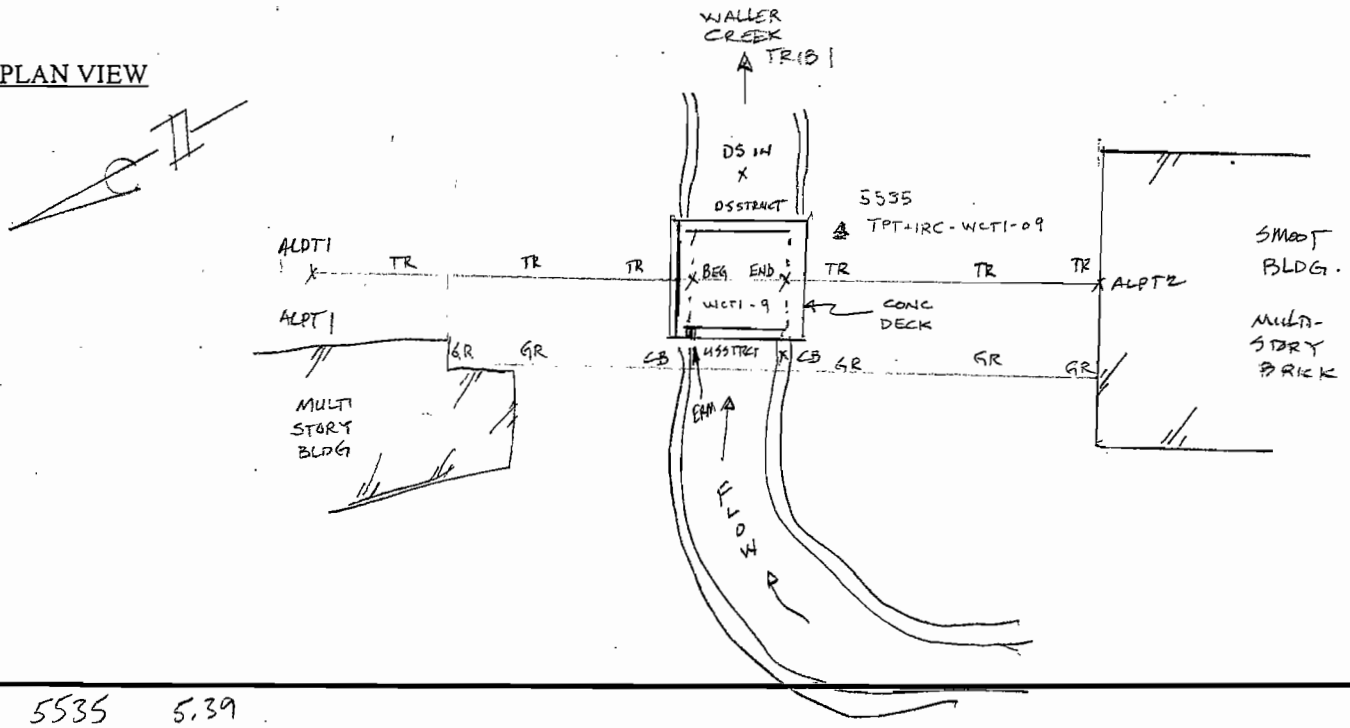
ADDL COMMENTS Shots 5539 – 5576 (Patio Deck over Creek)

Austin Presbyterian Seminary

PROFILE VIEW



PLAN VIEW



T @ 5535 5.39

135 @ 5384 5.47

5538 5.47 CHK + 5384 (ERR 0.00 / 0.01)

5576 5.47 CHK + 5384 (ERR 0.00 / 0.01)

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1-10

STREAM NAME: WALLER CREEK TRIB 1 DATE: 01-10-08

LOCATION: 2ND PED BR. US OF SPEEDWAY CREW MOSELEY COMBS

TYPE BR (✓) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5094

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) — @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

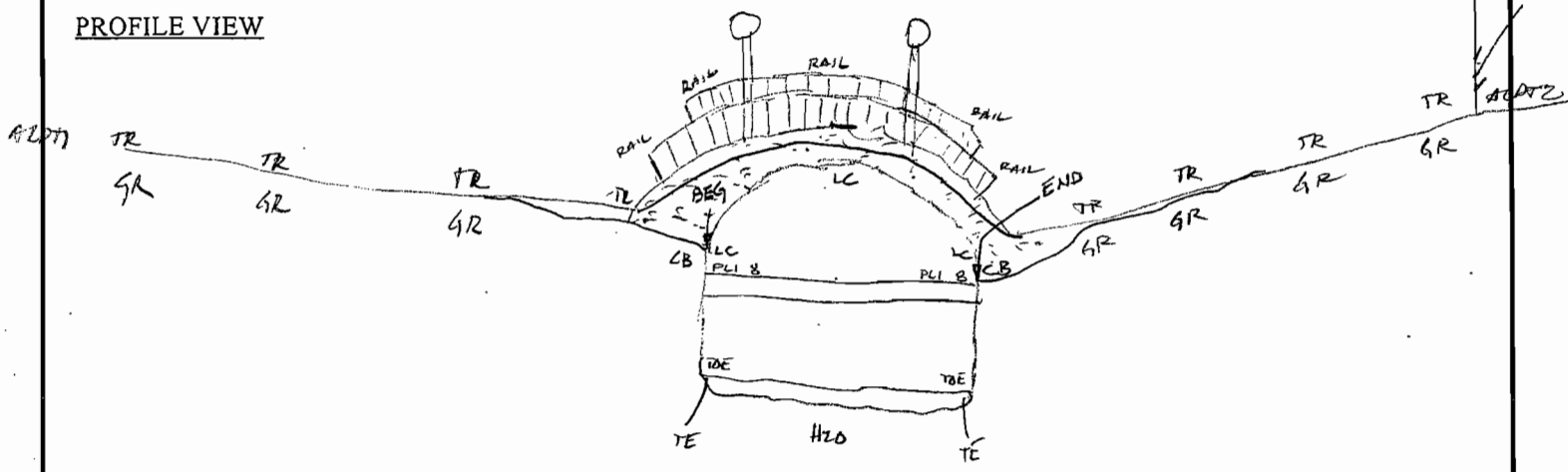
DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: "U" CUT ON US ℄ TOP CURB

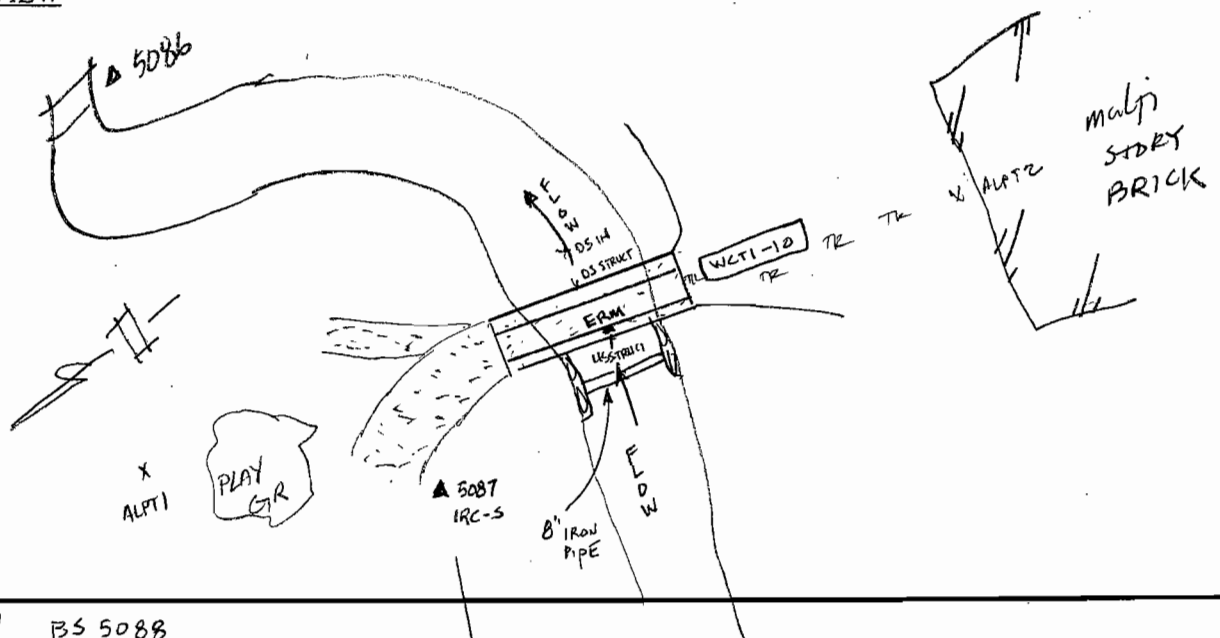
ADDL COMMENTS SHOTS 5093 - 5140

PED BR. @ EAST END APT COMPLEX / SOUTH OF PLAYGROUND

PROFILE VIEW



PLAN VIEW



T @ 5087 BS 5088

HI = 5.25 HT = 4.67

5093 4.67 CHK + 5088 <ERR 0.01 0.01>

5094 5.80 ERM BR WCT1-10

5140 4.67 CHK + 5088 <ERR 0.01 0.01>

TO 5088

00-00-00 180-00-17 265.94

135-44-52 315-45-16 183.32 5.11 TPT7IRC-S

5086

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1 11

STREAM NAME: WCT1 DATE: 1-14-08

LOCATION: 2nd PED BR DS OF 30th CREW MOSELY REED COMBS

TYPE BR (A) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5340

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

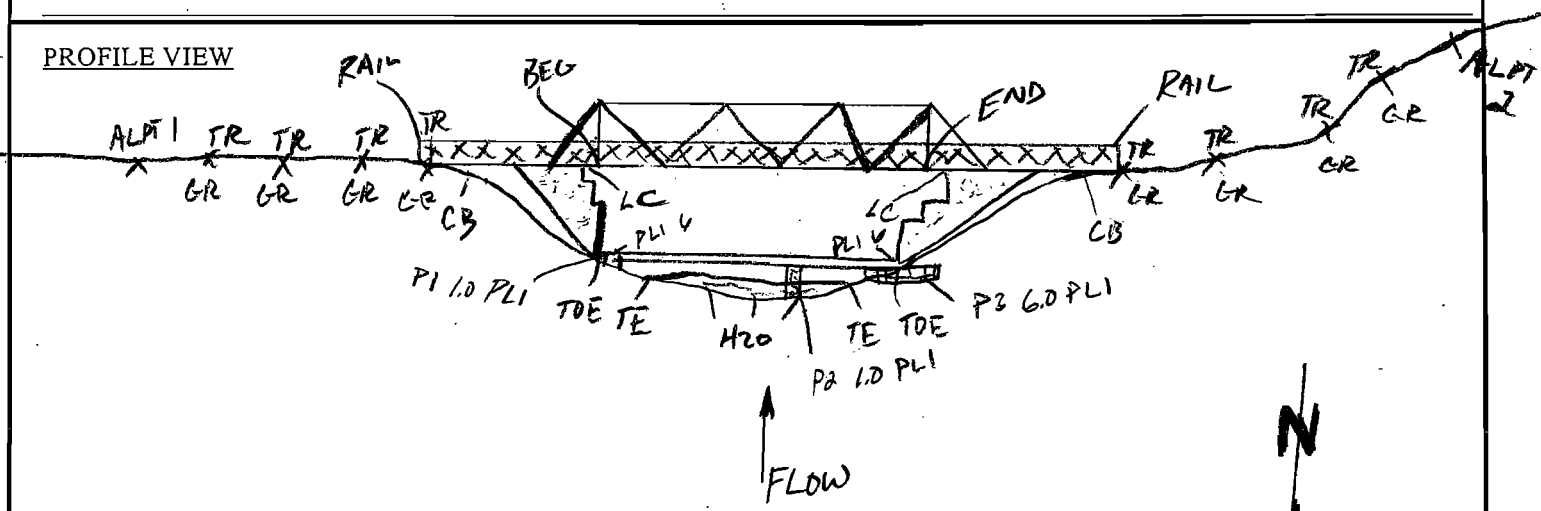
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: SQ CUT ON US LEFT @ TOP ABUT

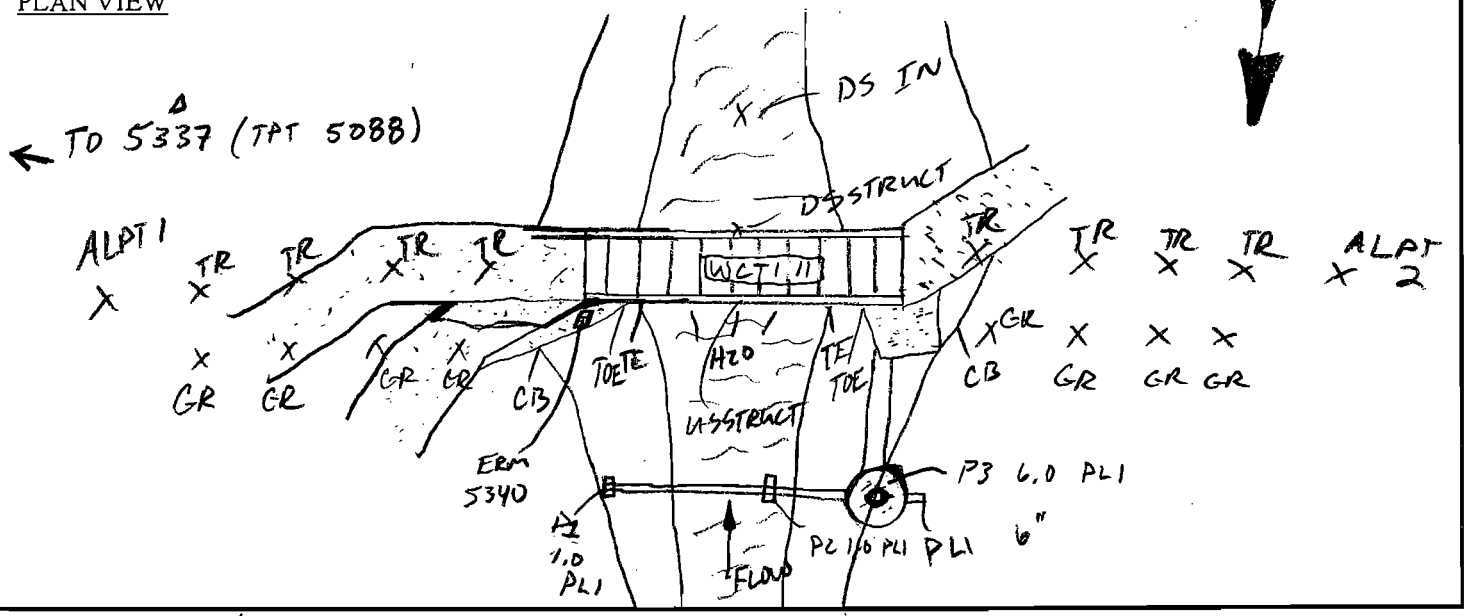
ADDL COMMENTS SHOTS USED 5339 - 5385 GPS PTS 5089

PROFILE VIEW



FLOW

PLAN VIEW



T 5337 <5.11> (TPT 5088)

BS 5089 <5.08>

5339 CHK + 5089 <ERR 0.00 0.00>

5384 CHK + 5087

5385 CHK + 5089 <ERR 0.01 0.01>

00-00-00 180-00-35 475.21 5.08 TPT + IRC

5384 187-56-19 7-57-03 265.93 5.23 TPT + IRC

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1 12

STREAM NAME: WCT1 DATE: 1-14-08

LOCATION: 1st PED BR DS OF WCT1 13 CREW MOSELY REED COMBS

TYPE BR ~~(X)~~ CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5295

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

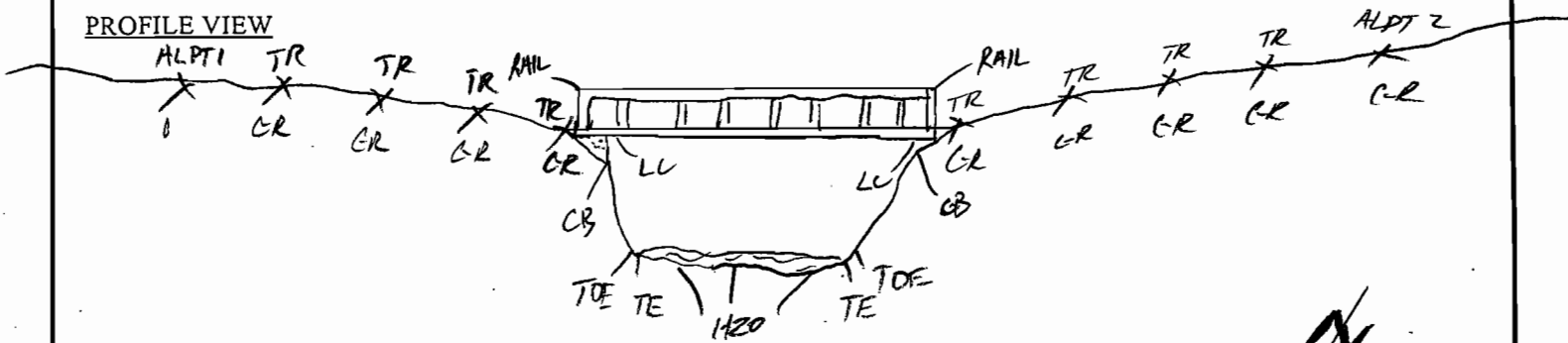
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

ERM DESCRIPTION: SQ CUT NS LEFT ON CONC

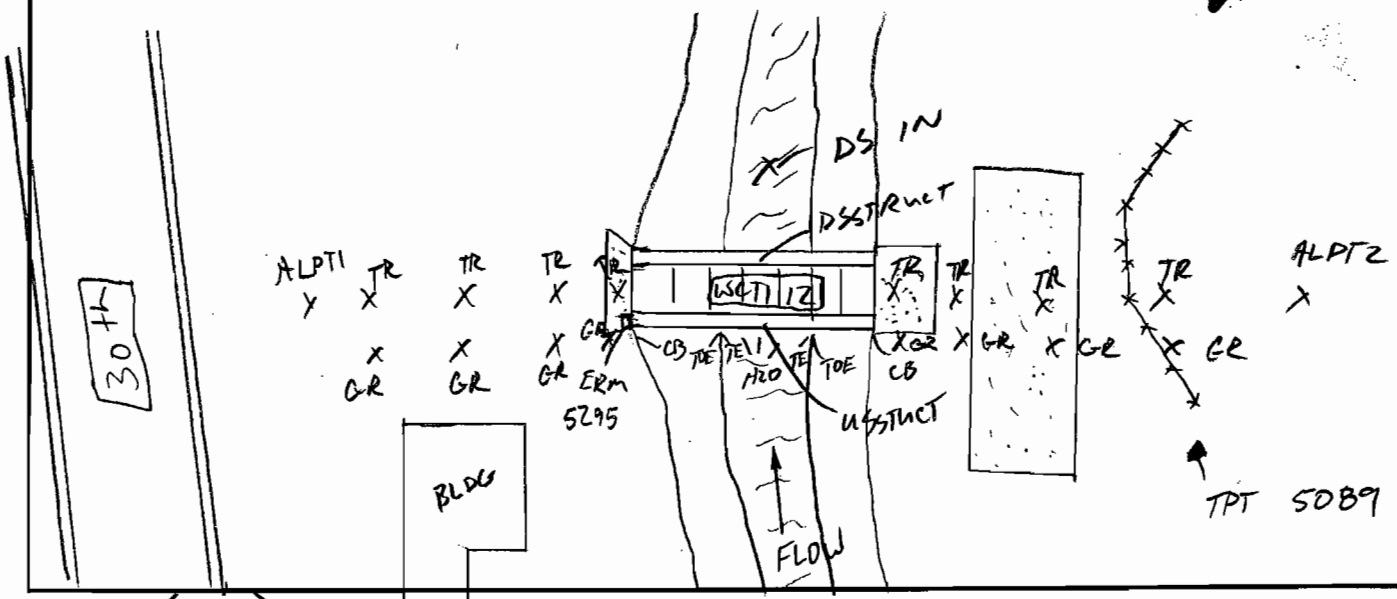
ADDL COMMENTS SHOTS USED 5294 - 5338 GPS PTS 5089 - 5090

PROFILE VIEW



FLOW

PLAN VIEW



↑ 5089 <5.33>
BS 5090 <5.15>

5294 CHK + 5090 <ERR 0.05 0.06>
5337 CHK + 5088
5338 CHK + 5090 <ERR 0.05 0.04>

00-00-00 180-00-27 479.11 5.15 TPT + IRC
5337 164-53-40 344-54-12 479.19 5.17 TPT + IRC

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1 13

STREAM NAME: WCT1 DATE: 1-14-08

LOCATION: HEMPHILL & 32nd CREW MOSELY REED COMBS

TYPE BR ~~(X)~~ CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5248

BRIDGE RAIL 3,5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

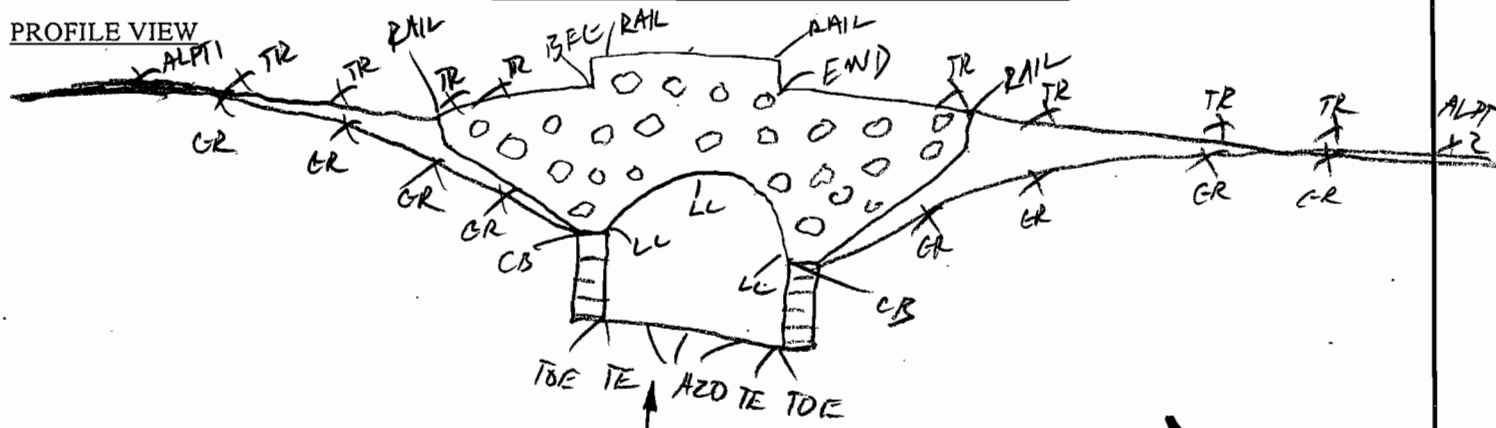
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

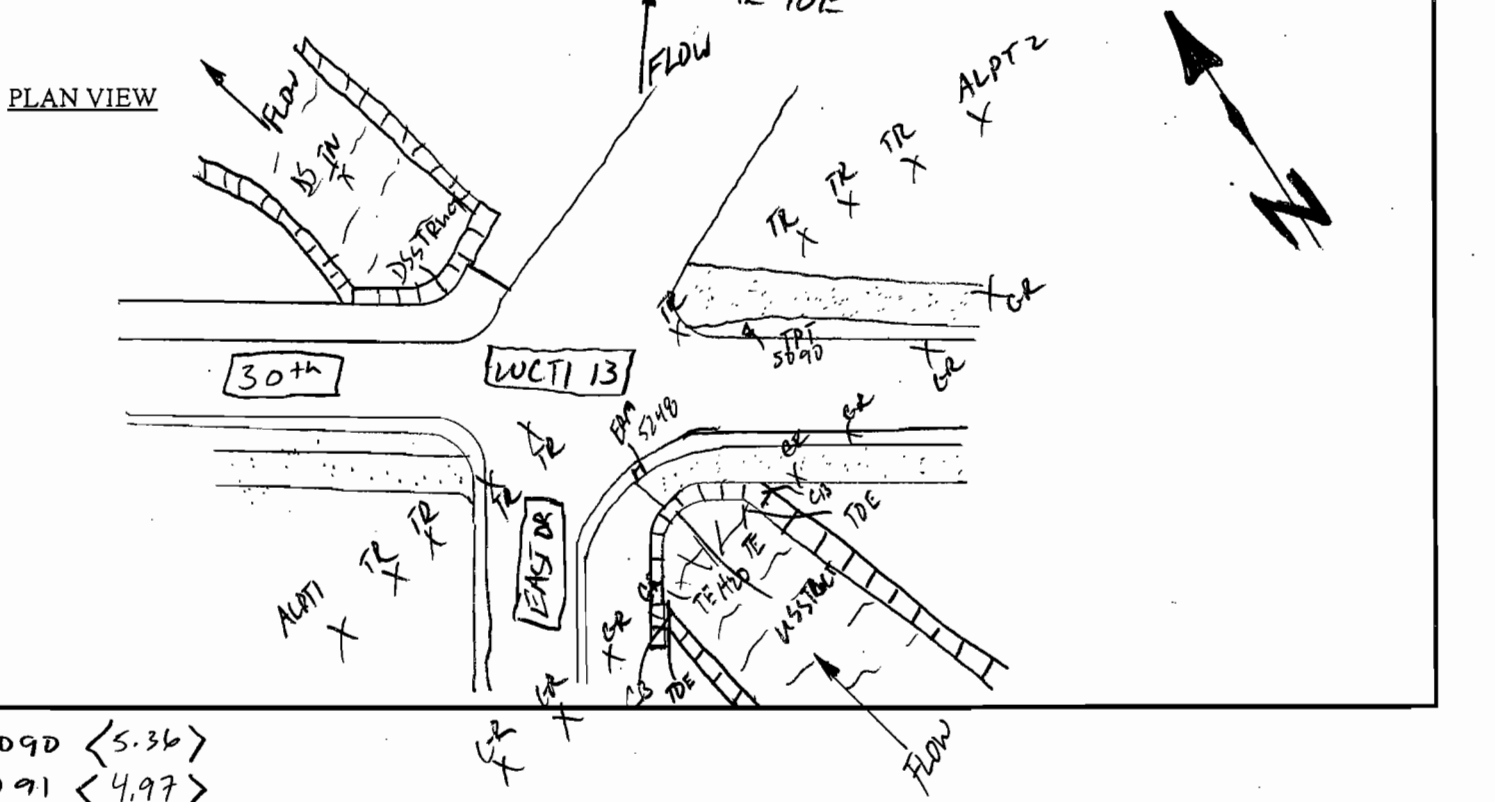
ERM DESCRIPTION: SQ CHT NS & BOC

ADDL COMMENTS SHOTS USED 5247-5293 GPS PTS 5089-5091

PROFILE VIEW



PLAN VIEW



T 5090 <5.36>

BS 5091 <4.97>

5247	CHK + 5091	<ERR	0.11 0.07 >
5292	CHK + 5089	<ERR	0.03 >
5293	CHK + 5091	<ERR	0.01 0.04 >

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME WCT1 14

STREAM NAME: WCT1 DATE: 1-14-07

LOCATION: HEMPHILL & WHEELER CREW MOSELY REED COMBS

TYPE BR(X) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5201

BRIDGE RAIL 3,5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

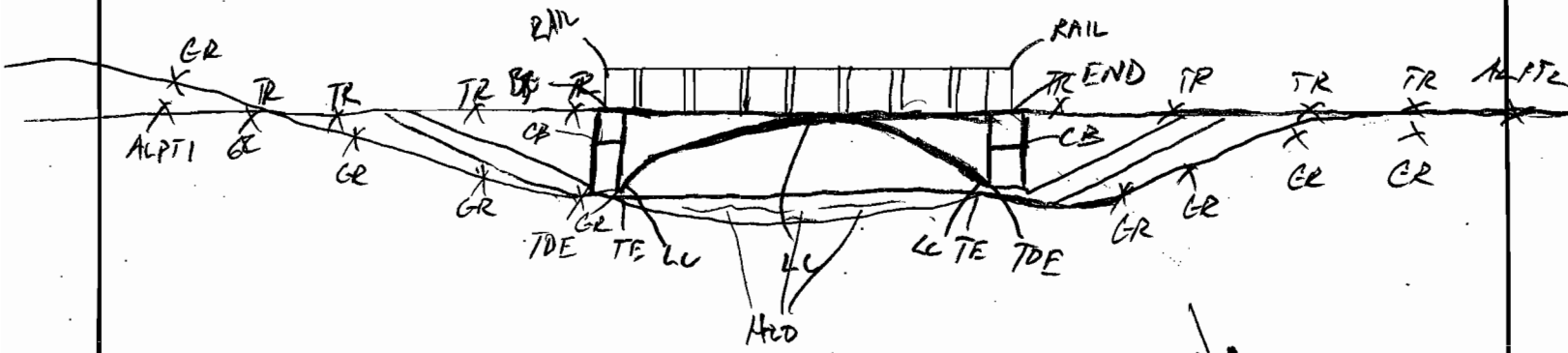
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

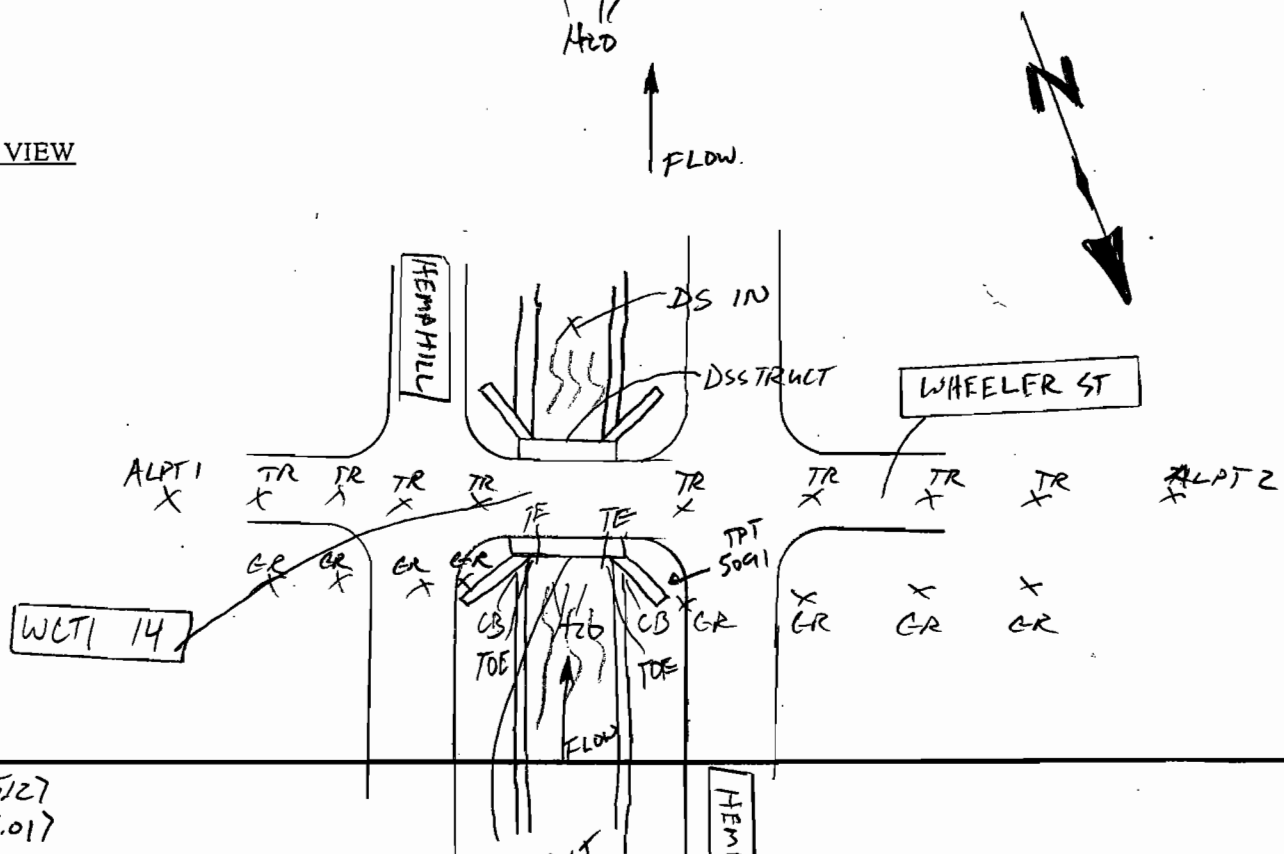
ERM DESCRIPTION: TRIANGLE END DS SIDE BOC

ADDL COMMENTS SHOTS USED 5200 - 5246 GPS PTS 5090 - 5092

PROFILE VIEW



PLAN VIEW



T 5091 (5.12)

BS 5092 (5.01)

5200 CHK + 5092 (ERR 0.05 / 0.18)

5245 CHK + 5090 (ERR 0.11 / 0.02)

5246 CHK + 5092 (ERR 0.05 / 0.11)

PROJECT: WALLER CREEK STRUCTURE NAME WCT1 15

STREAM NAME: WCT1 DATE: 1-14-08

LOCATION: HEMPHILL & 32nd CREW MOSELY REED COMBS

TYPE BR (X) CUL ( ) DAM ( ) XS ( ) ERM ELEV _____ ERM ID 5142

BRIDGE RAIL 3.5 DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

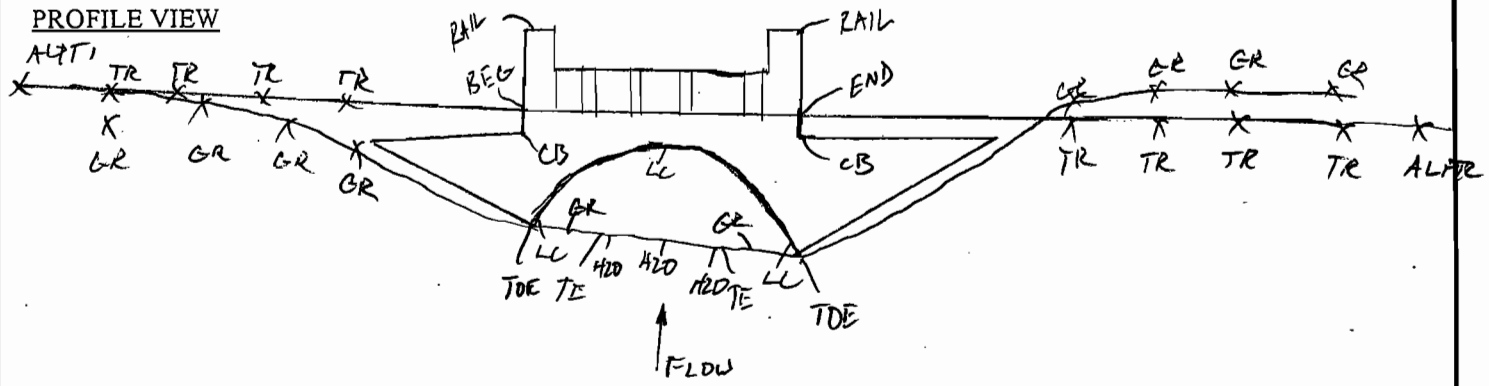
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

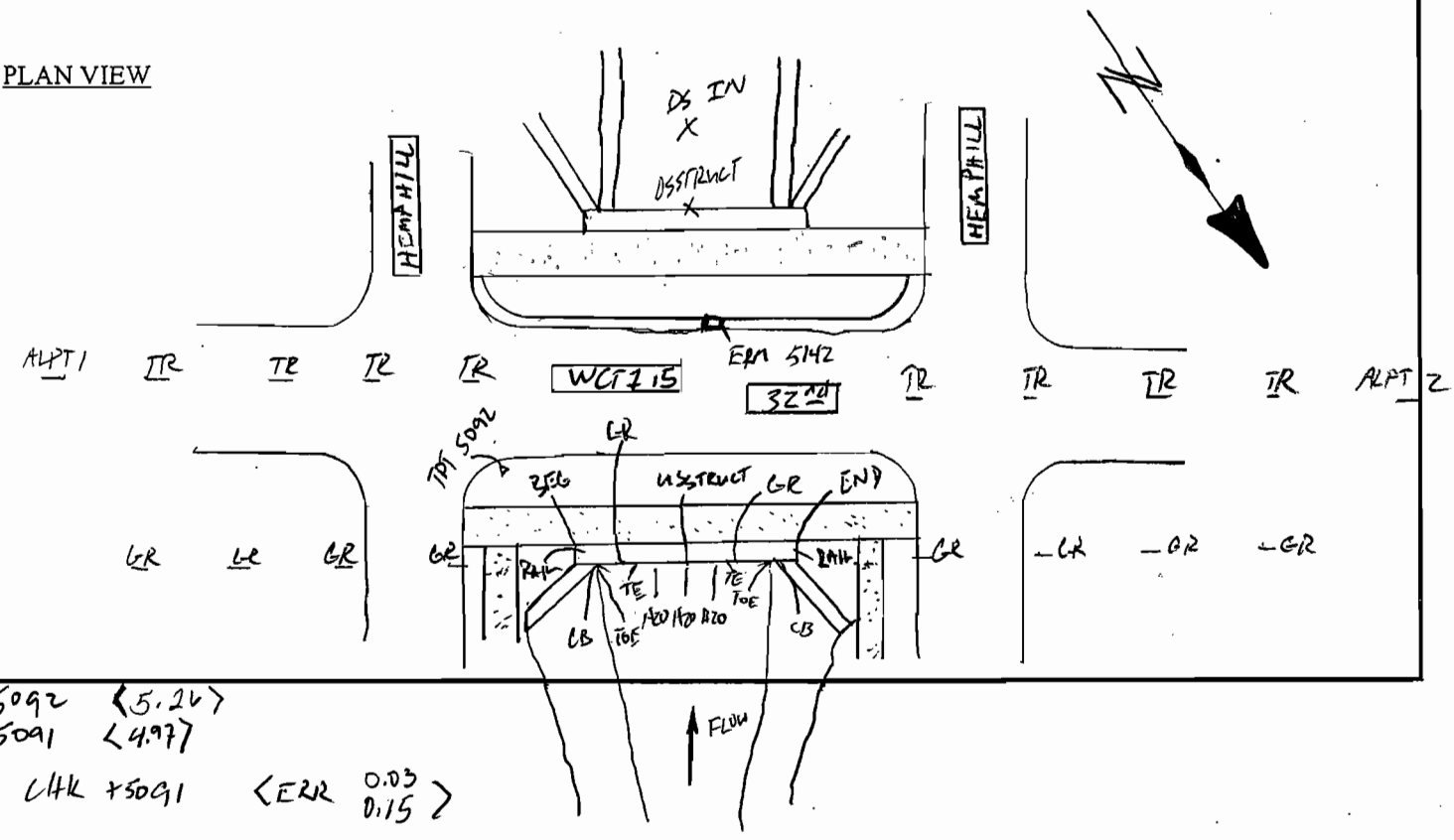
ERM DESCRIPTION: SQ CUT US & BOC

ADDL COMMENTS SHOTS USED 5141 - 5183 GPS PTS 5091, 5092

PROFILE VIEW



PLAN VIEW



↑ 5092 <5.26>

BS 5091 <4.97>

5141 CHK +5091 <ERR 0.03 0.15>

PROJECT: WALLER CREEK FLOOD STUDY STRUCTURE NAME XS 200' US of WCT1 15

STREAM NAME: WCT1 DATE: 1-14-08

LOCATION: US 200' of WCT1 15 CREW MOSELY REED COMBS

TYPE BR ( ) CUL ( ) DAM ( ) XS (/) ERM ELEV _____ ERM ID _____

BRIDGE RAIL _____ DECK _____ WIDTH _____ PIER(s) _____ @ _____ PIER SHAPE _____

CULVERT NUM# _____ SHAPE _____ LENGTH _____ SIZE H: _____ W: _____ SKEW _____

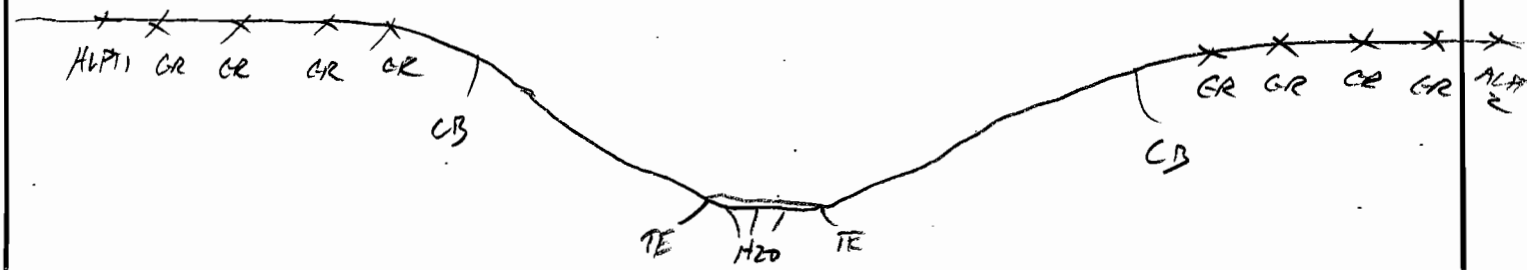
CULVERT I/O TYPE _____ MATERIAL _____ WINGWALL US: _____ DS: _____

DAM TOP WIDTH _____ SIDE SLOPE US _____ DS _____ RISER _____ x _____ SPY# _____

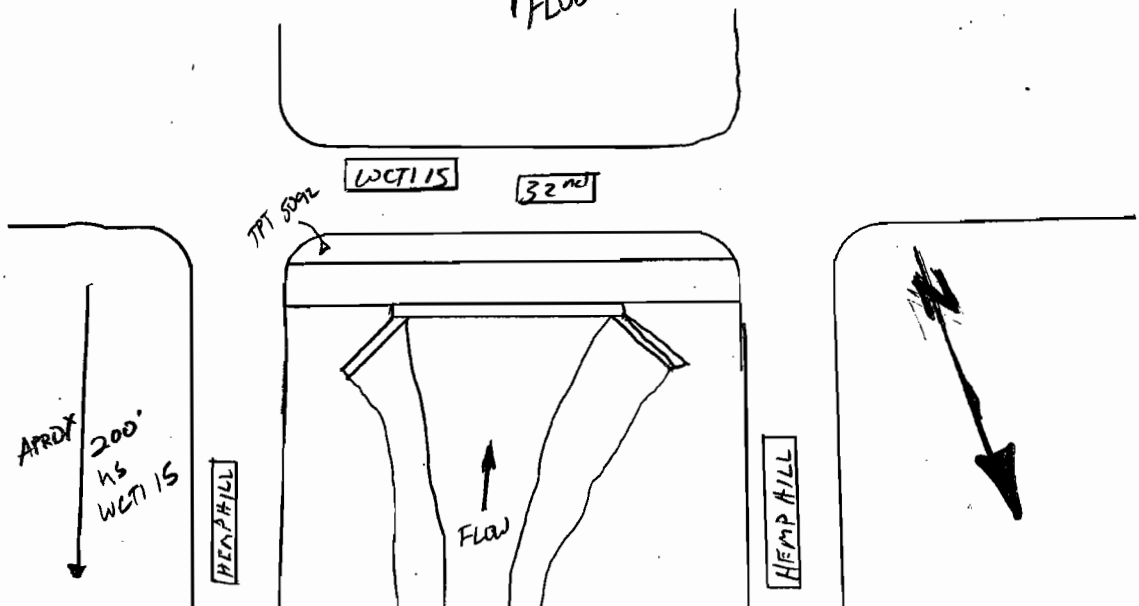
ERM DESCRIPTION: _____

ADDL COMMENTS SHOTS USED 5184 - 5199 GPS PTS 5091, 5092

PROFILE VIEW

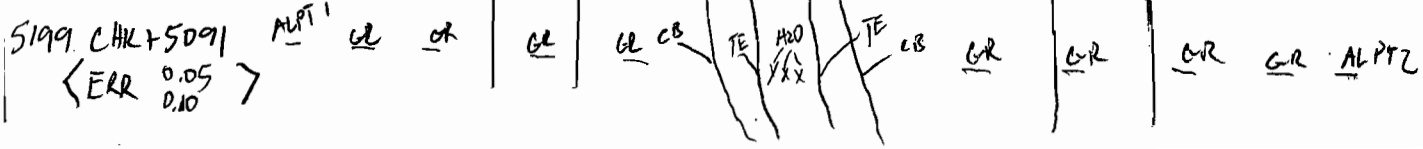


PLAN VIEW



T 5092 (5.26)
BS 5091 (4.97)

5199 CHK+5091 (ERR 0.05 0.10)



APPENDIX C

QUALITY ASSURANCE (QA) FORMS

SURVEY QA/QC CHECKLIST

Watershed Name: Waller Creek

Surveyor's Name(s): Chris Conrad, R.P.L.S.

Reviewer's Name: Chris Conrad, R.P.L.S.

I. FIELD DATA:

- ☒ GPS calibration verified
- ☒ Multiple data for each control point
- ☒ Cross sections taken perpendicular to flow
- ☒ Complete cross section
- ☒ Points checked to sketch
- ☒ All cross section collected
- ☒ ERM set at bridges
- ☒ Shot taken on ERMs

II. DATA PROCESSING AND INSERTION:

- ☒ Control GPS processed and checked
- ☒ Points checked to LIDAR
- ☒ Verify elevation to each other
- ☒ All cross sections processed
- ☒ ERM elevations calculated/checked
- ☒ Points coded correctly

QA/QC APPROVAL:

Surveying QC review is in compliance with the contract requirements and all task "checkpoints" are complete. Task checklists have been appropriately documented and signed by the surveyor, and then forwarded to the production team along with all check prints/drafts and text.

Task Leader: _____ Date: 8/15/08

Project Manager: _____ Date: 8/15/08

City of Austin: _____ Date: _____

P:\active\6030.02.111 WCT GIS Based Restudy\TSDN\Survey\Survey QAQC checklist.doc

APPENDIX D

DIGITAL SUPPORT DATA

APPENDIX D: CD WITH ALL APPLICABLE DATA

This CD contains all applicable data with regard to the survey data for the Waller Creek Restudy portion of the Waller Creek Tunnel Project. The outline shown below is a directory tree of files included on this CD.

CD OUTLINE

- ReadMe file with CD directory *TSDN_Appendix D CD Directory and ReadMe.doc*
- *080829_TSDN_Survey.pdf*
- Microsoft Word DOC Version of TSDN *080829_TSDN_Survey.doc*
- *TSDN Tables Waller.XLS*
- Spatial Files
    - Hemphill Branch Surveyed Bridge and Cross Section SHP file *WLR_XS_HEM.shp*
    - Waller Creek Surveyed Bridge and Cross Section SHP file *WLR_XS.shp*
    - Waller Creek Survey Points SHP file *WLR_Survey_PT.shp*
    - Hemphill Branch Survey Points SHP file *HEM_Survey_PT.shp*
    - High-Definition Survey TIN for Lower Watershed *Lower_WLR_HD_TIN*
- Survey ASCII files (folder containing ASC files) ref. TSDN Table 6.5 for ASC naming convention
- Survey Structure Photos (folder containing JPG files) ref. TSDN Table 6.5 for JPG naming convention
    - Example of JPG naming…
        - *WC8_DSC.JPG* --- Waller Creek, structure 8, downstream channel
        - *WC8_DSF.JPG* --- Waller Creek, structure 8, downstream face of structure
        - *WC8_USC.JPG* --- Waller Creek, structure 8, upstream channel
        - *WC8_DSC.JPG* --- Waller Creek, structure 8, upstream face of structure